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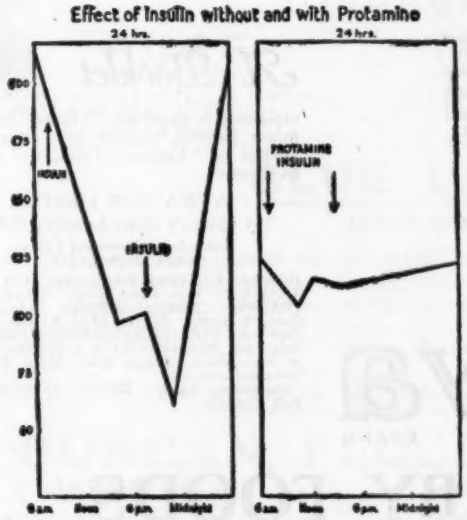

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MILK TONIC
Minadex and milk combine to form a complete food tonic, ensuring a basic intake of protective and formative minerals and vitamins. It is standard practice in many schools to add a teaspoonful of Minadex to the usual one-third pint of milk.
PRODUCT OF THE GLAXO LABORATORIES
MINADEX

In the work of accelerating patients' return to duty, and of limiting the number needing prolonged attention, Syrup Minadex is of the utmost service. The health it restores is sustained. Every component of the three groups of therapeutic agents* exerts a recognised reconstructive and tonic effect. Minadex raises the haemoglobin, restores neuro-muscular tone; normalises calcium-phosphorus metabolism, and fortifies the epithelial structures, thus raising resistance to infection. Minadex is usually administered from the spoon, or in water or in a glass of milk. It may also be used in the dispensary, as a mineral-vitamin basis for individual "tonics."

* *Per fl. oz.:*
Ferri et Ammon. Cit. 13½ grs. Mang. Glycerophosph. 1/25 gr. Cupr. Sulph. 1/25 gr. Calc. Glycerophosph. 2 gr. Pot. Glycerophosph. 1/5 gr. Sod. Glycerophosph. 1/10 gr. Vitamin D 3,000 i.u. Vitamin A 18,000 international units.

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In 6-oz. and 12 oz., bottles, and 80-oz. winchesters.

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These three varieties are guaranteed to be absolutely pure according to the specifications of the British Pharmacopœia. They are the result of many years' experience in the manufacture of Anæsthetics, and are recognised as the most reliable and perfect products offered to the Medical Profession.

LITERATURE AND PRICES ON APPLICATION

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In Convalescence from Influenza the characteristically profound lassitude and the low blood-pressure are likely to be accompanied by diminution of the capacity for digesting food and by slight anæmia.

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Parenteral **Oral** **Rectal**

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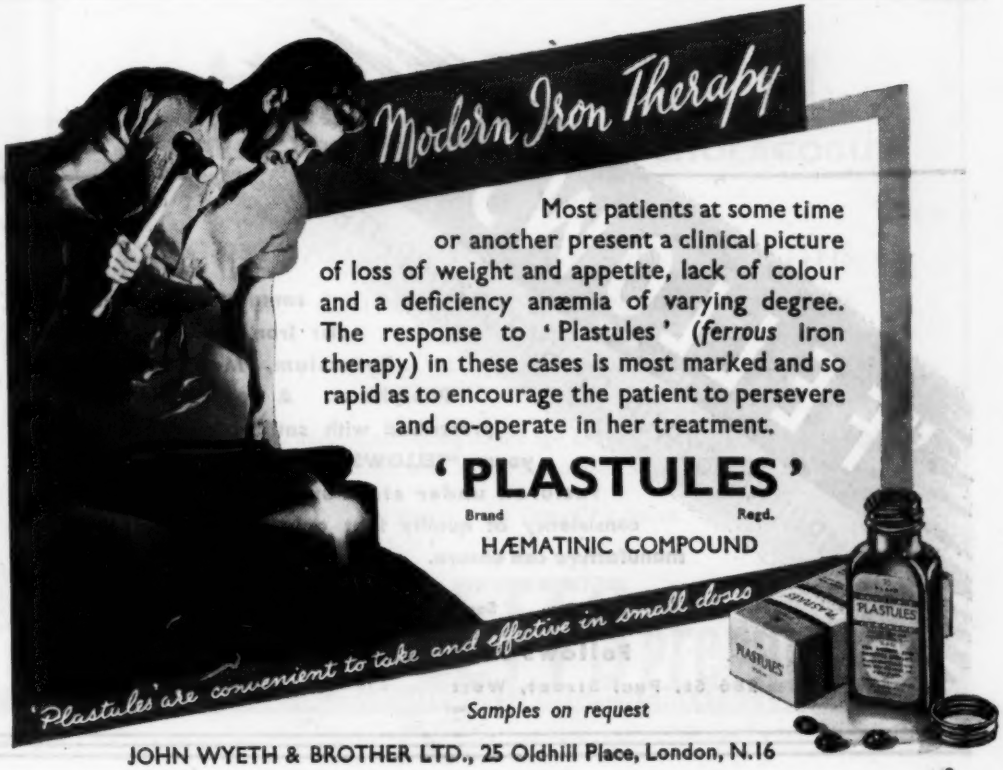
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Most patients at some time or another present a clinical picture of loss of weight and appetite, lack of colour and a deficiency anæmia of varying degree. The response to 'Plastules' (*ferrous* iron therapy) in these cases is most marked and so rapid as to encourage the patient to persevere and co-operate in her treatment.
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HÆMATINIC COMPOUND
'Plastules' are convenient to take and effective in small doses
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9

Compensating for the Deficiencies in restricted Diet

Dietary restrictions, whether they are required temporarily during fever or over long periods as in the treatment of peptic ulcers or arising through anorexia—or idiosyncrasy on the part of the patient—may often prove the unwitting cause of vitamin and mineral deficiencies. The vitamins of the B group, for instance, are particularly liable to be inadequate in invalid diets. The supply of available iron, too, may be seriously curtailed when green vegetables and other sources have to be forbidden.

A complete supplement containing ALL the vitamins and minerals which are likely to be deficient is therefore a valuable adjunct to treatment in sickness and convalescence.

Complevite provides, in a single preparation, vitamins A, B1, C, and D, with calcium, iron and phosphorus in carefully-balanced proportions. The formula of Complevite is based on a careful consideration of the actual deficiencies which occur in ordinary diets; so that where dietary restrictions are unavoidable the dosage may be increased with advantage at the discretion of the physician.

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IN ACUTE TOXÆMIA OF BURNS—*Lancet*, 1936, June 20th, p. 1400.

Three cases of acute toxæmia from burns were treated with EUCORTONE and recovered. In two of the cases, death within a short time could have been predicted almost certainly. In the investigators' experience of these conditions, recovery under any methods of treatment previously used had not occurred. The investigators attributed the recovery in these cases with every confidence to EUCORTONE.

EUCORTONE is biologically standardized on adrenalectomized animals. **It has now been further purified and concentrated.** It is practically free from nitrogen and adrenaline, contains no irritant or toxic substance, and is sterile. **One c.cm. of the extract is equivalent to 75 grams of adrenal cortex or about 110 grams of the whole gland.**

EUCORTONE is administered intramuscularly, intravenously (in crises), and subcutaneously (in chronic cases).

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In rubber capped bottles of 10 c.cm., 20/- Particulars and literature on application.

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A GENERAL APERIENT and CHOLAGOGUE

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Over 35 years' reputation.

DOSE : 10 to 60 minims, according to the age and condition of the patient. One drachm is a direct aperient and is not accompanied by griping and tenesmus.

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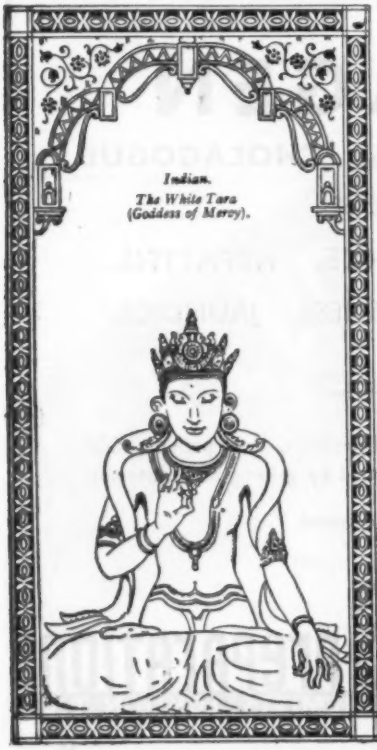

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HEXOBARBITONE

A QUICK-ACTING LIGHT HYPNOTIC

Hexanastab-Oral is a safe, rapidly absorbed hypnotic with a short intensive action. It is particularly suitable for persons whose sleep has been interrupted by air raids or who have experienced severe mental strain and are unable to fall asleep.

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Tube of 10 tablets, 2/3
Bottle of 25, 5/-
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VITAMIN 'B'

The three most important components of the Vitamin 'B' group of vitamins are Vitamin B_1, lactoflavine (Vitamin B_2) and nicotinic acid (a precursor of the pellagra-preventing factor of the Vitamin B_2 group); all three are issued under the B.D.H. brand, and they have the following specific indications:—

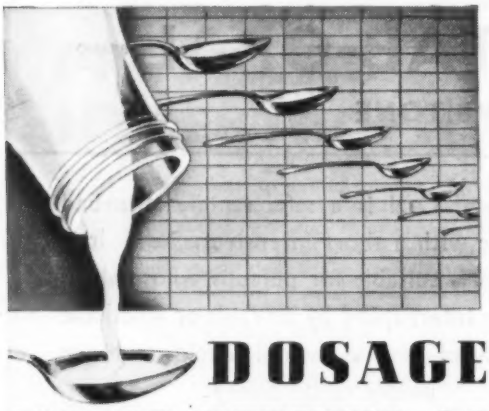
VITAMIN B_1 B.D.H.		LACTOFLAVINE B.D.H.		NICOTINIC ACID B.D.H.	
Anorexia	Neuritis	Cheilosis	Pemphigus	Pellagroid Dermatoses	Ptyalism
Bradycardia	Œdema	Cataract	Photophobia	Vincent's Angina	Glossitis
Constipation		Corneal Vascularisation		Certain Psychoses	

Specific treatment with Vitamin B_1 B.D.H., Lactoflavine B.D.H. or Nicotinic Acid B.D.H., according to the particular symptoms manifested, usually brings relief. Secondary symptoms can be eliminated by the administration of Livogen.

Literature on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

VitBCom/E/421



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'Petrolagar' is thoroughly miscible with the intestinal content. The oil functions as unabsorbable fluid which affords a softened bowel content and a comfortable bowel motion.

DOSAGE CAN BE REDUCED AS 'HABIT-TIME' IS REINSTATED

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Brand Paraffin Emulsion

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The Vicious Circle in Haemorrhoids Effectively Broken

BEGINS WITH CONSTIPATION → IS SOON FOLLOWED BY IRRITATION
HÆMORRHOIDS ← INFLAMMATION ← CONGESTION
Anusol Haemorrhoidal Suppositories

Painful stools and the increasing fear of them lead to irregular bowel movements and consequently to constipation. So the vicious circle starts all over again in an aggravated form.

In an entirely mechanical and rational way, Anusol Suppositories provide freedom from the distressing symptoms of haemorrhoids and other inflammatory and painful conditions in the ano-rectal region.

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Available also in Ointment form

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With the decrease in purchasing power that has occurred since the onset of the war, there is a tendency to replace the more expensive protective foods by carbohydrate-containing foods. This has a double significance : it means that the intake of essential vitamins is diminished and that the diet becomes unbalanced.

More than one of the vitamins of the B complex is concerned in the metabolism of starches and sugars and if the consumption of carbohydrates, for example as bread, porridge and cakes, is increased, it must be accompanied by a similar increase in the amount of vitamin B complex.

Marmite yeast extract is a valuable source of the vitamin B complex, all constituents of which are present. It therefore holds an important position in the war-time dietary.

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Jars : 1-oz. 6d., 2-oz. 10d., 4-oz. 1/6, 8-oz. 2/6, 16-oz. 4/6.
Special terms for packs for hospitals and welfare centres.

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TRADE MARK **'ENTORAL'** BRAND

Oral Cold Vaccine

● 'Entoral' has been subjected to careful clinical investigation among industrial and institutional groups, office workers, and school children. Increase of species-specific and species-broad (heterophile) immunity to the secondary pathogens of the upper respiratory tract by its use has decreased at least 60 percent the incidence of colds in the vaccinated units and has controlled the severity, duration, and disability of infections in persons not completely protected.

Vaccination with 'Entoral' involves the administration of a single capsule of the vaccine daily for one week, followed by one capsule twice a week throughout the period when upper respiratory infections are prevalent. Immunization should be repeated annually.

'Entoral' brand oral cold vaccine is supplied in bottles of 20 and 60 'Pulvules' brand filled capsules.

ELI LILLY AND COMPANY LIMITED
BASINGSTOKE AND LONDON

S. U. P. 36

In the Treatment of Influenza and Pneumonia

The intramuscular injection of S.U.P. 36 is an established routine in the treatment of inflammatory and septic conditions, particularly of the respiratory system.

In many instances one injection or, at the most, two injections (one on each of two successive days) of 1 c.c. of S.U.P. 36 will cause a rapid fall in temperature with a marked cessation of the characteristic symptoms followed by a shortened period of convalescence and an uninterrupted recovery.

The value of S.U.P. 36, however, is not confined to its beneficial effects in respiratory diseases; in other febrile states such as acute renal inflammation, acute fibrositis, and, in fact, in a variety of conditions in which marked pyrexia is an outstanding symptom S.U.P. 36 can be employed with the expectation of producing beneficial effects.

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Sup36/E/58

GLYCURRANT

COUGH LINCTUS

is a new expectorant and sedative preparation, particularly suited to dry coughs, such as that of chronic bronchitis. Its carefully planned composition includes the juice of ripe black currants, an agent which is well known for its soothing effect on the pharynx, and which gives a distinctive, delicious flavour to the mixture.

FORMULA:

Liquid Ext. of Squill ..	m. ½	Glycerin	.. m. 10
Liquid Ext. of Senega	m. 1	Menthol	.. gr. 1/150
Solution of Tolu ..	m. 5	Alcohol	.. m. 4
Codeine Phosphate ..	gr. 1/16	Black Currant Juice..	m. 10
Syrup of Wild Cherry..	m. 6	Syrup to	.. 1 fl. dr.

In bottles of 2½ and 5 ozs., at 1/6 and 2/9.

DOSAGE—It is recommended that, for adults, one teaspoonful of Glycurrant Cough Linctus undiluted should be sipped slowly every 3 or 4 hours.

Descriptive literature and clinical trial sample will be sent on application.

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IN all degrees of this minor, but distressing, complication of pregnancy, from nausea and perverted appetite to actual vomiting, Pulv. BiSoDoL will prove acceptable to the sensitive patient. It is pleasantly flavoured with Oil of Peppermint and forms a palatable suspension in a small amount of water.

The minute sub-division of its components, obtained by a special process, ensures rapid and effective action; the addition of Mag. Carb. Levis assists in preventing constipation. 'BiSoDoL' is composed of bismuth subnitrate, magnesium carbonate, sodium bicarbonate, papain, diastase and peppermint oil.

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18

For active, lasting immunisation against tetanus

TETANUS TOXOID (ALUM PRECIPITATED)

Lederle

TETANUS Toxoid (Alum Precipitated) closely resembles the similar preparation of diphtheria toxoid in its essential nature.

The toxicity of tetanus toxin is destroyed by a limited action of formaldehyde. The resulting product, toxoid, retains the ability to stimulate antitoxin production, and its antigenic activity is considerably increased by alum precipitation.

Two doses each of 1 c.c. administered intramuscularly, with an interval of 2 months between injections, are recommended as the optimum condition of administration for the maximum immunity response within a short time.

In "Tetanus Toxoid (Alum Precipitated) *Lederle*" an effective and harmless immunising agent is available in

2—1 c.c. vials 10 c.c. vial.

For passive protection or therapeutic treatment TETANUS ANTITOXIN "GLOBULIN MODIFIED" *Lederle* is recommended. With this antitoxin of high concentration and purity, adequate dosage is obtainable in convenient volume and in this form reactions are reduced to a minimum.

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Ampoules, Oil Solution

DESCRIPTION: Pure corpus luteum hormone (progesterone). Biologically assayed and standardized in international units. 1 mg. = 1 international unit.

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DIRECTIONS: Injected intramuscularly.

HOW SUPPLIED: In sterile vegetable oil, 1 international unit per 1 cc. ampoule. Boxes of 8 ampoules.

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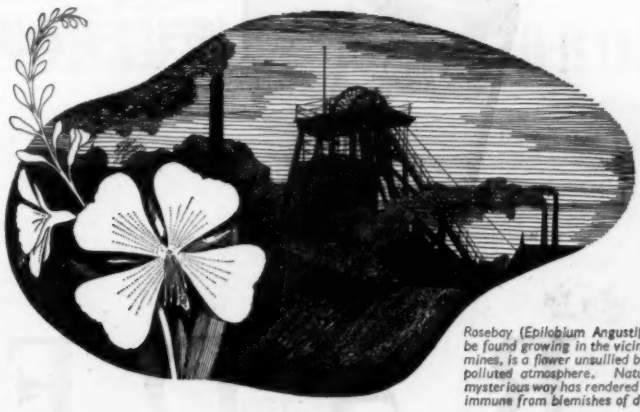

Rosebay (Epilobium Angustifolium), to be found growing in the vicinity of coal mines, is a flower unsullied by the dust-polluted atmosphere. Nature in her mysterious way has rendered this flower immune from blemishes of dust.

Immunity from Colds

The changed environment caused by evacuation.
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Restricted ventilation of black-out requirements.
The intensive industrial drive.

All these circumstances demand that every precaution be taken to prevent the wide-spread occurrence of colds. Specific prophylaxis is a vital part of any preventive measures and beneficial results can be obtained in a high percentage of cases by injections of Common Cold and Anti-Catarrh Vaccine (Evans). This is a natural vaccine prepared from a wide variety of carefully selected strains of bacteria known to be responsible for the secondary infections associated with the common cold.

Common Cold & Anti-Catarrh Vaccine

(Evans)

is issued in Ampoules and Rubber-capped Bottles

Further details will be supplied on application to Home Medical Dept., Hanover Street, Liverpool

Evans Sons Lescher & Webb Ltd.

Liverpool and London

Each fl. oz. represents:
Vitamin A .. 16,500 Int. units
Vitamin D .. 5,500 Int. units
Vitamin B_1.. 75 Int. units
with Vitamin B_2.
Iron and Ammon. Citrate 4 grs.
Manganese Citrate, Soluble $\frac{1}{4}$ gr.
In a palatable base containing malt extract.

IRRADEX

IRRADEX provides the fat-soluble vitamins A and D in a most pleasantly tasting form, far superior to cod-liver oil; the growth-stimulating vitamin B in sufficient quantity; the anti-anæmic effects of iron and manganese; and the nutritive and diastasic value of malt.

Irradex is specially indicated for children or adults who are underweight, have little appetite, or who have not regained healthy vitality after some acute infection.

The moderate secondary anæmia which so frequently accompanies undernourishment or general debility is an indication for Irradex.

During pregnancy and lactation, or other periods of stress, Irradex is especially indicated. It may well be prescribed for its nutritive effect in convalescence from operations.

DOSAGE: For Children, $\frac{1}{2}$ to 1 teaspoonful. For Adults, 1 dessert spoonful. These doses may be repeated three times a day

Irradex is supplied in containers of approximately 1 lb., 2½ lbs. and 7 lbs.

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PHENOBARBITONE and BROMIDE

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Phenobarbitone and Bromide
POISON
DIRECTION.—One, or more, to be taken with a little water, before meals, or as directed by the physician.
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MADE IN ENGLAND

In Nervous Dyspepsia and Diarrhœa, Nervous Insomnia and other conditions of Nervous Excitability, Delirium Tremens and Epilepsy

An effective preparation of Soluble Phenobarbitone and Potassium Bromide, having prolonged sedative action.

℞ *Phenobarbitoni Solubilis,* gr. 1/3 [0·022 gm. approx.]
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Bottles of 25 products, 1/-
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RHEUMATOID ARTHRITIS

costs approximately thirty shillings

Ampoules of 0.01 *gm.*, 0.02 *gm.*, 0.05 *gm.* *and* 0.10 *gm.*

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Serious reactions encountered in the past have been largely due to excessive dosage.

If the recommended dosage is adhered to and the patient examined for contra-indications, toxic manifestations rarely present a serious problem.

PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD., DAGENHAM

ORIGINAL ARTICLES

TREATMENT OF WAR WOUNDS OF THE LIMBS

EXPERIENCE IN 266 CASES

BY SOLLY M. COHEN, M.A. Cape Town, F.R.C.S.
AND
C. A. R. SCHULENBURG, M.B. Cape Town, F.R.C.S.
SURGEONS IN AN E.M.S. HOSPITAL

A NUMBER of men wounded in the evacuation from Dunkirk were admitted direct to this hospital for immediate surgery, and others were transported from the coastal areas where primary treatment had already been carried out. Many of the surgeons who had treated them in the first place had no opportunity of observing the subsequent progress of their cases, since they were almost immediately evacuated to base hospitals. Observations, both of our own cases and of the transferred cases, have enabled us to follow their progress in detail and to assess the value or dangers of different methods of treatment.

These cases represent a mixed group. Some were wounded in Belgium or France, some were casualties at sea and the majority received their injuries on the sands at Dunkirk. All the cases operated on at this hospital had been wounded at least 24 hours before admission, and the majority had received their injuries 40–72 hours previously. We had the opportunity of treating and observing the progress of 266 wounds of the extremities.

With the attention focused on plaster treatment, there is a tendency to regard the treatment of the wound as a mere incident, and to dismiss the discussion of the details of its toilet under the general term of "débridement." Plaster is, however, by no means the only consideration, and on the adequate treatment of the wound much of its success will depend. Our cases come under the category of "late" cases, and in a mobile war the difficulties in the collection and transport of the wounded must inevitably result in there being some delay in bringing casualties to the surgeon.

ANÆSTHESIA

Several cases were admitted where the exploration of the wound had been done under local anæsthesia, and this could not possibly have been satisfactory. Even a small bomb splinter was often found to have produced severe internal destruction of the tissues. Because of this we invariably employed general anæsthesia. The routine use of Evipan or Pentothal, followed by gas and oxygen, was most satisfactory. The dosage of evipan was limited to 10 c.cm. and only in one case, where this was exceeded, was there temporary respiratory depression.

THE WOUND

As a routine, the surrounding skin was cleansed with ether soap, shaved, and washed with saline, the wound in the meantime being covered with a saline swab. No antiseptics were employed in the wound. Except for excision of the skin edge no extensive débridement was carried out. Obviously tattered shreds of fascia, muscle or tendon were simply divided and removed. No attempt was made at excision of the damaged and lacerated tissues.

Skin.—The frayed irregular edges of skin were excised with scissors and the wound laid widely open by making several radiating incisions. This permitted of a wide exposure for exploration and subsequent drainage without needlessly sacrificing a large amount of skin. The results show that there is no danger of these incisions extending or disseminating the infection.

Fascia.—We consider this layer of paramount importance, and great attention was always paid to it at operation. Although there was only a small hole in the fascia there was often extensive disruption of the deeper tissues. This cloaking fascia acts like an elastic case, walling in the cavity and maintaining it under pressure. To allow of adequate drainage relaxation of the fascia is essential. The principle of radiating incisions was again employed. The tension of the fascia was thus eased, and there was then no obstruction to the full external drainage of the depths of the wound. The importance of the fascia becomes enhanced in the thigh, where the fascia lata is of exceptional tensile strength.

Muscles.—No attempt at excision or trimming of muscle was made. Considerable importance was attached to the cellular spaces between the muscle-bellies, and in the subsequent packing care was always taken that there should be uninterrupted drainage from these. No suturing of tendons was done, but the remnants of any presenting frayed ends were removed.

Bone.—Only fragments completely detached and lying loose were removed. All other fragments, however flimsily attached, were left. This should be stressed, as one case admitted here after "débridement" had a gap of two inches in the tibia, due to the fact that *all* the fragments had been carefully removed!

Nerves and Vessels.—No suturing or trimming of any divided nerve was done, nor was it considered justifiable to explore a nerve so as to be sure of its continuity. "Concussion" of a nerve from a neighbouring wound was present in 7 cases, 5 being the common peroneal, 1 the radial nerve, and 1 the brachial plexus. Bleeding

FIG. 1—Entry wound of shell fragment in middle of thigh, with incision in buttock for its removal, and counter-incisions for drainage of the track.

points were clamped but not tied. In 1 case only, where the ulnar artery had been divided, was it found necessary to tie both ends. There was only 1 case of secondary hæmorrhage, where the popliteal artery had been damaged by a bomb splinter.

Through-and-through Wounds.—The same principle of adequate drainage was applied here. It was found unnecessary to lay the whole track widely open. By enlarging the entrance and exit wounds by radiating skin and fascia incisions the course of the track could be readily and efficiently packed with petroleum-jelly gauze. Several cases were admitted where the muscles and tissues had been much mutilated in an attempt to excise the whole track.

Foreign Bodies.—All cases were X-rayed before operation, and full use was made of the portable X ray. This was found to be particularly important, for these high-velocity fragments often travelled considerable distances from the entry wound. The rule applied was that foreign bodies were only removed if readily accessible. The large fragments, it was found, always carried some cloth with them, and abscesses had already formed on admission. Large splinters were always removed, but no attempt was made to remove the small splinters lying some distance from the entry wound, probably embedded in muscle. Subsequently, in a few cases, localised abscess formation around a foreign body necessitated incision, and the fragment then presented itself.

Peppered Wounds.—In these cases the wounds were due to numerous tiny splinters, thirty or forty at least. We did not try to remove these. The whole limb was

FIG. 2A—Apparatus for applying shoulder spica, showing patient in position.

shaved and carefully cleaned, and wisps of petroleum-jelly gauze inserted into the larger wounds.

Counter-incisions.—The disruption caused by a large fragment leaves a blood-filled space, which the entrance wound can only partially drain. The principle of counter-incisions, as employed in any large abscess cavity, was therefore often followed. Thus, in one patient the entry wound was on the anterior aspect of the middle of the thigh (see fig. 1) and the foreign body lay far back in the buttock. To drain the whole track adequately several counter-incisions were necessary. Although pus was already present at the time of the operation (72 hours after injury) convalescence was uneventful. In making counter-incisions, it is important to see that the drainage is established at the lowest part of the cavity.

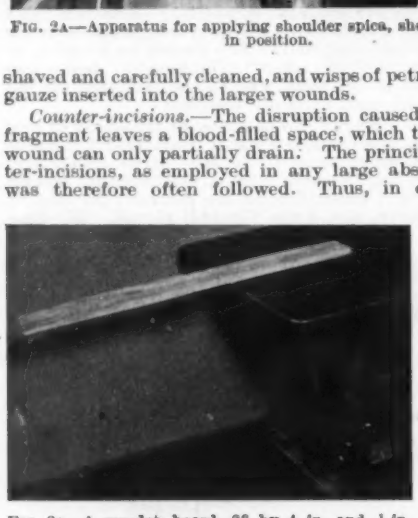


FIG. 2C—A wooden board, 36 by 4 in. and ¾ in. thick, nailed to a wooden table, may be used instead of the arrangement shown in fig. 2B.

PETROLEUM-JELLY PACKING

No antiseptics whatever were employed in the wound itself. Petroleum-jelly gauze was used throughout for packing into every recess and intermuscular plane, a two-inch gauze roll being used. At subsequent changes of plaster it was striking how much of this packing was extruded. Petroleum-jelly packing was preferred to plain gauze. Our previous experiences showed that the granulations invaded the mesh of the dry gauze, and that on changing the dressing there was more bleeding due to damage of the granulation tissue. There was seldom a rise in temperature after changing the plaster in our cases. The Spanish writers, however, often mention in their articles that a rise in temperature was to be expected with the change of plaster. The use of dry gauze, with damage to the granulations on its removal, may allow of absorption and may be one explanation of this rise of temperature. With plain gauze there was always a great deal of excoriation or pustular dermatitis of the surrounding skin. This fact is commented on by d'Harcourt and others (1940), and so troublesome was it in their cases that they even delayed reapplying the plaster for a few days until this dermatitis had subsided. We found that if the surrounding skin was liberally coated with a thick layer of petroleum jelly—applied with a spatula—the dermatitis was prevented. Excoriation only occurred if the pus flowed beyond these limits. In these cases if the excoriated area was coated with petroleum jelly it was not necessary to delay reapplication of the plaster, and at the next dressing the excoriated area was invariably found to have healed.

THE PLASTER

We used a thin layer of sterilised plaster wool over the wound, the rest of the plaster being skin tight. Trueta and other Spanish surgeons applied their plasters directly to the skin, and Girdlestone [1] even writes of moulding the plaster itself to the wound. Trueta,[2] in his book, also considers the chemical action of the direct plaster to be of value. We agree, however, with Pannett [3] that a certain amount of wool to absorb the initial blood-stained serum is an advantage. From our results it appears that the immobilisation of the limb itself, which can only be obtained by immobilising the joint above and below the injury, is not affected by a certain amount of padding. With hip and shoulder spicas we feel that a certain amount of padding around the trunk is essential for the comfort of the patient. The possibility of completely immobilising the soft tissues by a skintight plaster is questionable, for, however closely the plaster is applied—e.g., in the thigh—the surgeon can always insert his fingers immediately afterwards between it and the limb. Moreover, a feature of these late cases was the presence of œdema. However closely a plaster was applied—and there was only slight padding over the wound—it was loose after 48 hours. One of the main principles, therefore, was that no local plaster was sufficient, and to obtain adequate rest for the affected part it was essential always to immobilise the joint above and below. Thus, for an elbow injury a full shoulder spica was required;

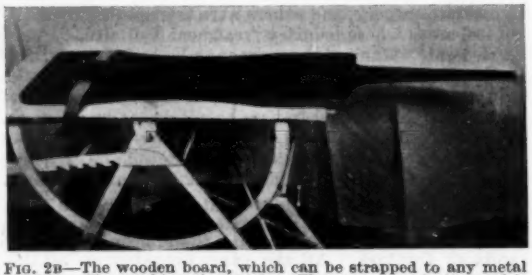


FIG. 2B—The wooden board, which can be strapped to any metal table. The total length is 50 in. The narrow, projecting end is 18 in. long, 5 in. wide at its base, tapering to a width of 2 in. at its apex.

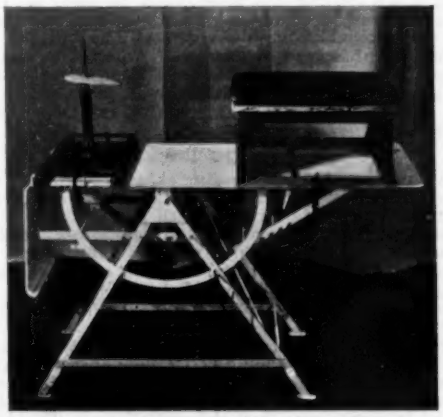


FIG. 3—Simple pelvic rest used for applying a hip spica. The patient's legs are held by assistants. Three sizes of pelvic rest are provided.

1. Girdlestone, G. R. *Lancet*, July 13, 1940, p. 31.
2. Trueta, J. Treatment of War Wounds and Fractures, London, 1939, p. 21.
3. Pannett, C. A. *Lancet*, July 20, 1940, p. 82.

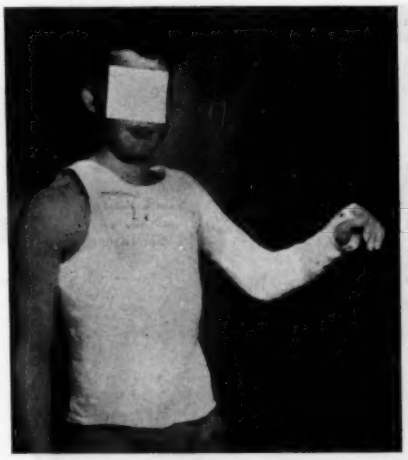
for a knee injury a hip spica was applied, and for an injury of the wrist the plaster extended up to the axilla. To assist in the reduction of the œdema it was made a rule that on return to the ward all limbs in plaster should be kept elevated until 48 hours after its application. For wounds of the lower limbs raising the end of the bed sufficed, and this was a great comfort to the patient.

Windows.—Several patients were admitted with plasters in which large windows had been cut over the wounds. All these cases showed "window œdema" with congestion of the tissues. The damage being caused may be best compared to the bulging and tearing of the tissues in a hernia cerebri. As soon as these cases were put into a closed plaster they were immediately comfortable, and their raised temperatures quickly subsided. The windows had apparently been cut to permit of inspection of the wound. Such morbid curiosity is unnecessary and serves no purpose. Continuous pain and fever with œdema of the fingers or toes are a sufficient signal that the treatment has been inadequate or that a severe infection is supervening. We found these three signs absolutely reliable.

Many still cling to windows for fear that gas-gangrene may be flourishing unseen under the plaster. In our series there were 4 cases where gas was actually present and *Bacillus welchii* was cultured, but these wounds were nevertheless placed in closed plasters and gave no cause for anxiety afterwards. These may be regarded as cases of pseudo-gas-gangrene, gas-forming organisms being present without "true" gas gangrene. The experience of Trueta confirms that the continuous pain and a rapid pulse may be relied on to draw attention at an early stage to the possibility of gas gangrene having supervened.

In none of our cases did we use any windows, nor was prophylactic anti-gas-gangrene serum given, and despite large lacerated wounds of muscles there was no case of true gas gangrene.

Application of the Plaster.—The proper application of a plaster requires a definite technique, and the art has to be acquired. Improper application may give the patient much misery and discomfort and may result in inadequate immobilisation. We applied all the plasters ourselves. In the midst of a large number of cases it was, however, fatiguing, and the surgeon would, in our opinion, do better to delegate the plaster work to trained teams. With an injury in the region of the elbow, for instance, the thought of another shoulder spica to apply when he is tired, may tempt the surgeon to use a short plaster only.



4A

FIG. 4A and B—Plaster cast for wounds of the upper extremity. In the shoulder spica note that the cast extends down over the iliac crests and across the opposite shoulder, there is no strut, and the arm is held in abduction and slightly in front of the coronal plane of the trunk.

4B

A standard technique was adopted for each type of plaster, and the nursing staff and assistants came to know exactly the position of the limbs and where to place the strengthening slabs. This enabled the plaster to be applied in the shortest time. Since then the assistant medical officers have been trained to apply the plasters in this way. In future we intend to leave the application of the plaster to these teams and confine ourselves to the treatment of the wounds. This confirms Trueta's experience that plaster teams are desirable.

Another fact not usually stressed is that in a rush period several tables are needed at the same time for severe injuries requiring plaster treatment, and it is unlikely that more than one orthopædic table (if that) is available. Some simple form of apparatus is essential for a spica, and the use of bowls or other rests is unsatisfactory and permits of no traction. The simple apparatus illustrated in figs. 2 and 3 was found to be very satisfactory. The types of plaster applied can be seen in figs. 4–8. No form of wood, aluminium or Cramer's wire was found necessary, even struts being made of plaster. It is an advantage for transportation, where notes are often lost or mislaid, to have the details of the cases written on the plaster with indelible pencil.

Smell.—The smell of the plaster does not worry the patient, the doctor or the nurse, but it certainly worries the other patients and visitors. We have tried mercurochrome, charcoal and different volatile oils, but none of these is really satisfactory. Pure Dettol dropped on the outside of the plaster seems to be the best, but its action is short-lived. To "fight one smell with another," as with Zipp,[4] may be a sound form of attack, but we were anxious not to apply any kind of antiseptic to the wound.

Altogether 84 cases due to gunshot wounds were treated in plaster. Of these, 54 cases were compound fractures, 36 being of the upper extremity, and 18 of the lower limbs.

5A

FIG. 5A and B—Cast for wounds of the forearm. Note that it extends up to the axilla, and that in the palm it does not extend beyond the distal palmar crease.

5B

4. See Connell, W. K. *Lancet*, July 6, 1940, p. 22.

COMPOUND FRACTURES

All compound fractures were treated in closed plasters. Reduction was obtained by manual traction only, and maintained while the plaster was being applied. In 1 case—a gunshot wound of the lower end of the femur—continuous traction was used by a pin through the upper end of the tibia. This was unsatisfactory, the patient's pain and fever continued and only settled when he was placed in a double hip spica with the hip and knee flexed. We have had no further experience of continuous traction in war injuries, but it seems that any strong traction will produce tension on the soft tissues, the avoidance of which is one of the principles in the treatment of the wound. Thus in none of the cases of gunshot wounds of the humerus was continuous traction employed.

It is too early yet, at the end of ten weeks, to judge the final results of all the cases, but we can say that this form of treatment has been saving of life and limb. We are well satisfied with the alignment of the fragments and length of the limbs. Nearly every case of upper-limb injury, including 7 with extensive shattering of the humerus, was up and about within ten days. Two examples of compound fractures are shown in figs. 9 and 10.

6A

6B

FIG. 6A and B—The single hip spica extends up to the nipples. The original radiogram showed radiating fissures extending upwards from the fracture into the knee-joint.

JOINT INJURIES

There were 10 cases of gunshot wounds of the major joints, 6 being penetrating wounds of the knee.

Bullets had been extracted from the knee-joints in 2 of the cases, their wounds sutured, and the patients transferred here in plaster. One of these, an airman, was operated on four hours after the injury, and the other twenty-four hours after the injury; both healed by primary union.

A third case was not quite so fortunate. The patient was admitted here ten days after primary suture following removal of a bomb fragment from the popliteal region. Fluid in the knee-joint had been noted but was not aspirated, and the patient was not immobilised in plaster. After transfer he became desperately ill, and aspiration and culture of the fluid showed a heavy infection with *Staphylococcus aureus*. The original wounds were reopened, the knee-joint laid open and petroleum-jelly packs inserted down to the capsule. A closed plaster hip spica was then applied, and a course of sulphathiazole (M. & B. 760) given. In the seventh week he is fit and has no pain, and the plaster is still unchanged, but a stiff knee is anticipated.

This third case illustrates what we have seen several times—that if a high-velocity splinter traverses the bone there are radiating fissures extending from its track into the surrounding bone, and these may act as a pathway of infection to the joint. In this case a small fragment had traversed the upper end of the tibia, and a radiogram showed a fissure extending into the knee-joint.

In 3 cases of penetrating wounds of the knee-joint there had been no primary treatment before admission. The injuries were over 24 hours old, and the joints were distended with blood. After aspiration through a clean field the wounds were enlarged down to capsule only, petroleum-jelly packing was inserted to this layer, and plaster was applied. In 1 case the shattered patella was left in situ, and will have to be excised later. In none of these cases did any sepsis supervene.

There were several other closed injuries of the knee-joint, where the capsule contained much fluid. In several of these the patients had been blown up by explosions at sea. The joints were aspirated and the leg encased in plaster. There is a traditional reluctance to aspirate a knee-joint because of the risk of sepsis, but if the operation is performed in the theatre the danger can be discounted.

SOFT-TISSUE INJURIES

There were 207 wounds involving the soft tissues only, of which 30 were treated in plaster. These 30 were extensive wounds of the limbs, and the same principles were applied as if an associated fracture had been present. Thus, for a gunshot wound tearing into the biceps muscle a shoulder spica was applied, and for a laceration of the thigh a hip spica. Even in the smaller wounds not treated in plaster immobilisation was

7A

7B

FIG. 7A and B — The double hip spica only extends to the costal margin, and the strut holds the two legs together.

8A

8B

FIG. 8A and B—For wounds below the knee the cast extends up to the groin. Note the flexion of the knee, the foot at right-angles to the leg and the platform for the toes.

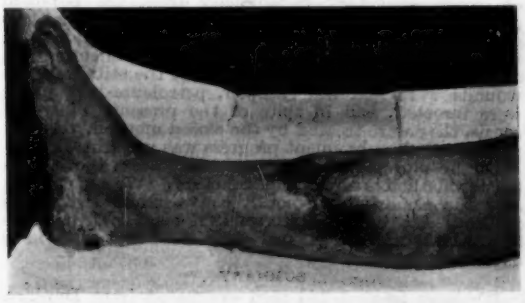
9A

9B

FIG. 9—Gunshot wound of right humerus. The first radiogram (A) was taken on admission and the second (B), with the arm abducted in plaster, ten weeks later. The wound is shown (C) ten weeks after admission. Note good position and callus formation. The bullet was not removed at operation because there was severe sepsis, and the foreign body lay some distance away from the wound.

9C

10A



10C

10B

FIG. 10—Gunshot wound of left fibula. The wound is shown (A) and (B) on admission, and again 10 weeks later (C), almost healed.

FIG. 11—Amputation for secondary hæmorrhage from popliteal artery treated in plaster. Note window to allow of compression of femoral artery.

assisted by the application of Elastoplast over the bandage.

In lower-limb injuries, even though merely muscular, early walking was not allowed and walking plasters were not applied. With muscle damage, the lymph circulation along the limb is hampered, œdema readily results as the limb hangs down, and this will interfere with the healing of the wound. When the patient was finally allowed to walk, after removal of the plaster, elastoplast was always applied, as in fracture cases.

The healing of these soft-tissue wounds treated in plaster was astonishing. At the end of six weeks large extensive wounds were clean, greatly reduced in size and rapidly becoming completely epithelialised. In several cases, to expedite healing, small "pinch" skin-grafts were applied.

CHEMOTHERAPY

After operation chemotherapy was employed as a routine with a standard dosage. Postoperative cases admitted with pyrexia were placed on a similar course. We used sulphanilamide, an initial dose of three tablets being followed by two tablets every four hours for forty-eight hours, and then one tablet every four hours for forty-eight hours, making a total dosage of 19·5 g. in four days. The nursing staff were told that no dose was to be omitted, even at night, for under morphine patients may sleep for twelve hours and thus miss three doses. No toxic effects were observed from this dosage. In our opinion a standard routine dosage should be adopted in every hospital; with so many patients having chemotherapy at the same time this will prevent inadvertent overdosage. Some of our patients had been given sulphonamides before their admission, but the dosage varied so much that it was impossible to assess the value of it. Sulphanilamide was not used as a local application to the wound. Sulphapyridine was reserved for cases with chest-wounds or where respiratory complications were anticipated. Our experience of sulphathiazole was limited to the case of acute staphylococcal arthritis of the knee-joint already mentioned. Several cases not treated in plaster developed what may be best described as "cold" sulphonamide abscesses—that is, an abscess was present with minimal local signs and no constitutional symptoms or pyrexia.

RESULTS

Of the 266 cases of gunshot wounds of the limbs admitted, 84 were treated in plaster, and 54 of these were compound fractures. There were 119 wounds of the upper limbs and 147 of the lower. There were no deaths and in only 1 case was an amputation necessary because of severe secondary hæmorrhage from the popliteal artery (fig. 11). No cases developed tetanus or true gas gangrene. In 10 of the patients who had been treated by primary suture before admission severe infection had already developed. After removal of the stitches these wounds were laid widely open, petroleum-jelly packs were inserted, and in spite of the presence of severe sepsis, they were treated by the closed method. All did well and their subsequent progress was uneventful.

Our results show that even in late cases the closed-plaster method is safe and satisfactory. We can confirm also the remarkably smooth convalescence with this method. At the end of ten weeks none of these patients is pyrexial, and the general condition of all of them is excellent.

SUMMARY

We have treated 266 men evacuated from Dunkirk with gunshot wounds of the extremities, including 54 with compound fractures. In 84 the wounds were treated by the closed-plaster method, and all patients operated on received a course of chemotherapy. There were no deaths; only one limb was amputated; healing has been rapid and uneventful; and after ten weeks the general condition of all patients is excellent. The value of the closed-plaster method both for fractures and injuries of the soft tissues is thus confirmed.

The technique adopted is described in detail.

BURROUGHS WELLCOME & CO. announce that as a war emergency measure designed to ensure adequate rest for their staff, their business premises will be closed on Saturdays except for emergency orders.

GLOSSITIS AND VITAMIN-B_2 COMPLEX IN PELLAGRA, SPRUE, AND ALLIED STATES*

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GLOSSITIS AND STOMATITIS OF ADDISONIAN PERNICIOUS ANÆMIA

The glossitis in addisonian pernicious anæmia was brought strikingly to the attention of the medical profession by Hunter (1909), who had closely studied 75 cases. The glossitis, he said, varied in intensity; severe inflammation was followed by degeneration and atrophy of the buccal and lingual mucosa.

Minot and Murphy (1928) asserted that complete remission of glossitis took place in patients on a full liver diet; but since then opinions have differed. Oatway and Middleton (1932), by taking impressions of the tongue on smoked paper, made permanent records of the progress of the glossitis under various forms of therapy; they concluded that all patients with pernicious anæmia who were not treated showed in their tongues some papillary atrophy, patients with hyperchlorhydria rarely showed smooth tongues, while those with achlorhydria or a tendency towards it invariably developed some smoothing of the tongue.

Ungley (1929) asserted that the lack of some factor in the gastric juice was responsible not only for the abnormal hæmopoiesis but also for the changes in the central nervous system and for the glossitis and associated intestinal symptoms.

PERNICIOUS ANÆMIA IN THE TROPICS

It is generally agreed that the blood-picture of advanced sprue is microscopically indistinguishable from that of pernicious anæmia. This fact is emphasised by Vaughan (1936), but a distinction, which appears to be rather artificial, is sometimes based on the higher bilirubin content of the serum in pernicious anæmia (2–5 indirect units). I made a point of investigating this matter in my series. In the great majority of sprue anæmias an indirect van den Bergh reaction of 1·0–2·5 units is obtained, rarely as high as 4·0 units. On the basis of this similarity of the blood-picture, the suggestion has been made that the sprue syndrome may represent a peculiar form of pernicious anæmia acquired in the tropics.

A series of 5 cases of pernicious anæmia from the tropics were diagnosed from their history, the absence of diarrhœa, occasional pyrexia, achylia gastrica without histamine response, the high van den Bergh readings, their reaction to parenteral liver therapy, and occasionally glossitis.

All were European males, aged 41–58, who had spent many years in India, Burmah, China, and Malaya; 2 had previously had chronic dysentery and diarrhœa lasting several years; in 2 glossitis with aphthous ulceration was noted, and in 1 there was increased sensitivity of the tongue. In 2 there had been appreciable loss of weight, but 1 was obese, weighing 13½ stone. In all the patients the typical lemon-coloured complexion was noted. In 1 sensory disturbances—numbness of hands and feet, with blunting of sensation below the knees—were present, but this case was further complicated by glycosuria and a high blood-sugar curve. In all 5 patients hæmic murmurs were noted, with low blood-pressure, averaging 100/70. Retinal hæmorrhages were present in 2, together with irregular pyrexia. The blood-picture was megalocytic with a high colour-index (with normoblasts in 2), the red cells varying from 1,700,000 to 3,380,000; indirect van den Bergh 1·0–2·5 units. In all the cases there was a satisfactory reticulocyte response to intensive parenteral liver therapy (campolon injections 4 c.cm. on alternate days and hydrochloric acid). In 1 case the glossitis (fig. V) yielded rapidly to treatment with nicotinic acid. Two men from India occasionally passed fatty stools (fat 35·5%) during the period of observation.

The differential diagnosis between sprue and pernicious anæmia may be complicated by previous tropical residence in cases of the latter; and there is then often a history of dysentery, diarrhœa, or gastro-intestinal

* With Coloured Illustrations on Plate in last week's issue.

disturbance, and occasional bouts of steatorrhœa. That this feature is not confined to pernicious anæmia may be gathered from the following case, which proved to be one of splenic anæmia. The interest lies in the fact that each recurring hæmolytic attack was heralded by aphthous stomatitis and sprue-like diarrhœa.

CASE 4.—A man, aged 28, who was observed from 1924 to 1928, had a sprue-like diarrhœa with aphthous stomatitis. Steatorrhœa persisted throughout and coincided with recurrent attacks of eczematous dermatitis of the legs. There was some anæmia, with high colour-index and leucopenia (4000). Sometimes the red-cell count fell to 600,000, with much anisocytosis. Achlorhydria persisted throughout. Two years before death splenomegaly and an eosinophilia of 20% were noted.

That pernicious anæmia and tropical sprue are closely related there can be no reasonable doubt, but it is not clear that true pernicious anæmia is common in natives of the tropics; most authorities deny it. The diagnosis of pernicious anæmia in indigenous inhabitants of the tropics is very difficult. In 3 of my cases, in the last twenty years, in native Indians in whom this diagnosis had been suggested, complicating infections by ankylostomes and other helminths prevented an absolute diagnosis. Most authorities assert that pernicious anæmia, as we know it, does not occur in native races; in fact de Langen and Lichtenstein (1936) assert that they have never seen it in their extensive experience in Java.

SUBACUTE COMBINED DEGENERATION OF THE CORD IN THE TROPICS

Subacute combined degeneration of the spinal cord in association with pernicious anæmia has been regarded by some observers as analogous to the changes in the cord in pellagra and as possibly caused by a deficiency of the vitamin-B_2 complex. It has generally been claimed that a distinction between pernicious anæmia and sprue may lie in the common association with lesions of the spinal cord in pernicious anæmia and their absence in sprue; but this is not strictly correct. In my series of 500 consecutive cases of sprue I have found such lesions in 2 cases only, and in each it was terminal.

CASE 5.—A man, aged 54, from Hong-Kong, had had sprue with glossitis (fig. VI) for more than ten years. In 1927 he arrived in England almost in extremis, with severe anæmia (hæmoglobin 10%, red cells 400,000 per c.mm.). Repeated bloodtransfusions effected a temporary recovery after several relapses. In 1931 signs of involvement of the spinal cord developed, with "band" pain and tingling in both arms and legs. Later, sensory disturbances with stocking anæsthesia were noted. A month later ataxy with increased deep reflexes and ankle-clonus, supervened, and within a year the patient died.

CASE 6.—A man, aged 59, had lived most of his life in Shanghai and had had chronic sprue with aphthous glossitis for three years or longer. The anæmia was megalocytic and severe (Hb. 60%, red cells 2,000,000); the fractional test-meal gave a normal acid curve with prompt histamine response. Six months later symptoms of involvement of the spinal cord became apparent, with "band" pain and stocking anæsthesia in the legs, steppage gait, increased deep reflexes, ankle-clonus, and positive Babinski sign. The cord lesions ultimately led to his death.

An analysis has been made of the clinical appearances and course of 8 patients from the tropics who had pernicious anæmia associated with subacute combined degeneration of the cord.

The difficulty in distinguishing this condition from sprue is well illustrated by two female patients. One was aged 36, from India, and the other 61, from British Guiana. In both there was a primary history of glossitis with aphthous ulceration for a year or more, followed by anorexia and sprue-like diarrhœa; then girdle pains, tingling, and numbness of limbs; severe anæmia (in the woman from India, red cells 540,000, Hb. 20%), retinal hæmorrhages, œdema of legs, achylia gastrica, dysphagia, and eventually signs of grave involvement of the spinal cord. In the woman from India complete paralysis, and in the woman from British Guiana paresis and ataxy of the legs, ensued. From the nature of the onset and from their tropical origin both cases had been diagnosed as sprue and treated with a milk diet; meanwhile the symptoms referable to the spinal cord had become progressively worse. In the first woman the deep reflexes were entirely absent, and in the second there were ataxy, increased reflexes, pseudoclonus of the ankles, slight spasticity, and loss of power, position, and deep pain sense. The first case has now been under observation for sixteen years, during which period the sprue-like symptoms have entirely disappeared and the glossitis has subsided. For the last fourteen years the stools have been normal. Under intensive parenteral liver therapy the blood has improved so much that there is now no anæmia, though paresis of legs still persists.

There were 2 cases in men, one aged 63 and the other 42, from India. In one glossitis was severe; the other had none. The man with glossitis resembled a case of pernicious anæmia, with lemon-yellow skin, retinal hæmorrhages, severe megalocytic anæmia, achylia gastrica, paresis of both legs, loss of vibration sense, tender calves and plantar muscles, increased deep reflexes, and extensor plantar response. During the period of observation this patient occasionally passed bulky fatty stools (30 oz. with fat 27%). The man without glossitis gave the clinical picture of subacute combined degeneration, though the anæmia was by no means so severe; and, though there was a history of dysenteric diarrhœa of a year's duration, there was no steatorrhœa. Intensive parenteral liver therapy was instituted, combined with courses of nicotinic acid 300 mg. daily for periods of fourteen days, and from the improvement in walking powers and stability I concluded that the P.P. factor exerts a favourable action on the lesions in subacute combined degeneration of the spinal cord associated with pernicious anæmia.

GLOSSITIS AND STOMATITIS OF IDIOPATHIC STEATORRHŒA †

Thaysen (1932) brought forward what he considered valid evidence that "non-tropical sprue" was the same as tropical sprue. There are, however, distinctive features in idiopathic steatorrhœa, particularly the osteoporosis and the anæmia, which is usually hypochromic, due to a deficiency of iron, and identical with that of cœliac disease in infants, although it is sometimes sprue-like and hyperchromic.

Latent tetany, megacolon, clubbing of fingers, and opacities of the lens are present, and in adults the hair tends to be fine and mud-coloured, with a tendency to early greying. In its relative failure to react to liver therapy idiopathic steatorrhœa differs essentially from tropical sprue and, in fact, often ends fatally without grave anæmia. It is becoming increasingly clear that idiopathic steatorrhœa is cœliac disease continued into adult life; and, as in tropical sprue, no characteristic pathological changes have been found to explain the disturbances of nutrition, though sometimes, as in tropical sprue, inflammation or even ulceration may be found in the gastro-intestinal tract.

Hansen (1937) considers that dysfunction of the suprarenal glands is the essential lesion, whereby absorption of glucose and fatty acids is affected, and conversion of provitamin B_2 into active lactoflavin is brought about by phosphorylation. He thinks that in some such manner the osteoporosis and pigmentation of the skin may best be explained.

As in tropical sprue, glossitis is conspicuous; in Thaysen's series it was obtained in 26 out of 34 cases. The inflammation was mostly confined to the tongue and indistinguishable from that of tropical sprue, but it was not observed in every relapse. As in tropical sprue, glossitis and angular stomatitis often appear as the first sign of the disease before the steatorrhœa.

Most authorities advocate intensive parenteral liver therapy, which appears to have some influence in checking the disease, but its effects are most variable. Nicotinic acid was administered intramuscularly by Bing and Broager (1938) in doses of 30 mg. twice daily in 2 cases. Some amelioration of the intestinal symptoms was noted, but improvement in other directions was not so satisfactory. Justin-Besançon and his colleague (1939) consider that the vitamin-B_2 complex acts on the metabolism of fats in idiopathic steatorrhœa. I have treated 2 cases with nicotinic acid and liver during the course of this study. In the first the results were surprisingly satisfactory and encouraging; in the second they were disappointing, but the action on the stomatitis appeared to be similar to that already observed in sprue.

† Also known as Gee-Herter disease, Herter-Heubner disease, or non-tropical sprue.

CASE 7.—A Norwegian, aged 58, was seen in 1938 with typical idiopathic steatorrhœa, glossitis, and angular stomatitis. He presented the usual appearances of this disease together with osteoporosis, hypocalcæmia, and anæmia. His tongue (fig. VII) was typical of tropical sprue with angular stomatitis. There were early greying of silky hair and fragility and ridging of the nails. He was advised that the liver therapy to which he had been subjected was not sufficiently intense, and he was given 10 c.cm. of campolon twice weekly for a year together with nicotinic acid 150 mg. daily. When seen again in March, 1939, he had remarkably improved. His weight had increased by 20 lb., his tongue showed no abnormality, and his stools were normal in size and colour. There were then no signs of anæmia.

CASE 8.—A man, aged 33, from Palestine, was in fairly good health during the first four months' residence in that country; then he developed steatorrhœa with two or three motions daily, glossitis, perversion of taste, meteorism, emaciation (loss of weight 56 lb.), œdema of legs and thighs, pain in the bones, and anæmia. He was admitted in December, 1939, as a typical case with brittle nails, dry skin, earthy complexion, and megacolon. A fractional test-meal showed slight hyperchlorhydria; flat blood-sugar curve; serum calcium 10·5 mg. per 100 c.cm.; slight megalocytic anæmia; fæcal fat 43%; osteoporosis of humeri.

Treatment.—Parenteral Hepatex 5 c.cm. daily (total 70 c.cm.) and nicotinic acid 300 mg. daily. No improvement took place till riboflavin 1 mg. thrice daily was added, whereupon the patient gained 8 lb. in ten days. He was seen again in February, 1940, when, though his weight had been maintained his general appearance was disappointing. He still had a definite megalocytic anæmia and bowing of the shoulders and back.

A third case, in a man aged 51 from Scotland, seen in 1938, was fatal. The patient exhibited the main features of the disease and had been ill for two years with steatorrhœa and glossitis. Intensive parenteral liver therapy, blood-transfusions, and calcium and iron therapy were persisted in for three months without any appreciable results.

GLOSSITIS AND STOMATITIS OF OTHER FORMS OF ANÆMIA

Smoothing of the tongue, with increased sensitivity, is sometimes found in severe secondary anæmias, notably ankylostomiasis, as described originally by me in Ceylon (Bahr 1915), and by Isaac et al. (1928) in anæmia caused by *Diphyllobothrium latum* in U.S.A. A similar atrophy of the lingual papillæ has been found in the tropical nutritional anæmias. Glossitis of secondary anæmias has been reviewed by Lewis (1930), who has found it in the Plummer-Vinson syndrome of anæmia, dysphagia, and malnutrition in undernourished women. Witts (1931) has recorded cases of anæmia, with normal gastric acidity, associated with this atrophic glossitis.

Tropical megalocytic anæmia is nutritional in origin, is admitted to be due to a deficiency of the extrinsic factor, and is common, especially in women aged 20–30, in West Africa, China, India, Malaya, and Greece. It is most often seen in association with pregnancy, syphilis, malaria, and intestinal parasites. The blood-picture is indistinguishable from that of pernicious anæmia, though the van den Bergh reaction is within normal limits. The gastric analysis shows the presence of free hydrochloric acid. Glossitis is, as a rule, less common than in pernicious anæmia.

BORDERLINE CASES

In a group of diseases presenting so many different symptoms and due to so many different factors it is not surprising to find aberrant or abnormal forms, such as cases of tropical sprue with symptoms of other well-recognised vitamin deficiencies. Thus, dusky pigmentation of the skin is seen in idiopathic steatorrhœa and in advanced tropical sprue.

In this series there are records of 5 cases of tropical sprue with pellagrous eruptions. They developed in 4 men and 1 woman, aged 60–75 years, who had had sprue for four years or longer, with numerous relapses, accompanied by glossitis, stomatitis, and severe megalocytic anæmia. In all the cases there was much steatorrhœa (fæcal fat 33–57%). In each relapse patchy pigmentation was noted on the forehead and arms, and, later, areas of reddish-brown scaly eruption on the hands and forearms, with atrophic wrinkled skin and subcutaneous petechial hæmorrhages. Before the introduction of nicotinic acid the dermatitis cleared up to a great extent under intensive liver therapy (injections of campolon 50–75 c.cm.). There was 1 fatal case in June, 1939, in which the eruption on the hands became more noticeable towards death.

In one case a pellagrous rash was so striking that its nature was apparent and was confirmed by its almost immediate response to nicotinic acid.

CASE 9.—A man, aged 60, seen in September, 1938, had had sprue for eighteen years in Hong-Kong and had kept strictly to a non-protein restricted dietary. He had had typical aphthous glossitis, angular stomatitis, emaciation, and anæmia.

Two and a half years after his return to England pellagrous dermatitis became evident, with pigmentation of the scalp, face, neck, hands, elbows, knees, and scrotum, together with exacerbation of glossitis and cheilosis. At the same time there were definite psychological manifestations. The stools were large and fatty (fæcal fat 57%), and there was a megalocytic anæmia, with Hb. 60%, 2,830,000 red cells, and 4280 leucocytes. A fractional test-meal showed hypochlorhydria. The response to nicotinic acid was immediate. On a dosage of 150 mg. daily for fourteen days the glossitis subsided, the stools became solid, and the pellagrous rash faded. During the next three months, while the patient was on a maintenance dose of 50 mg. daily, there was a rise of 41 lb. in weight, and his general appearance was so altered that his friends hardly recognised him. This improvement has been maintained ever since.

Such a case shows that pellagra can be superimposed on tropical sprue, even as it can on idiopathic steatorrhœa (Bennett et al. 1932) and on cœliac disease in children.

Vitamin-C deficiency.—Scorbutic phenomena in advanced cases of sprue show themselves in a tendency to bruising and petechial hæmorrhages on the hands and other parts of the body. At my request Dr. P. H. Martin estimated in 5 cases of advanced sprue the increased urinary excretion of vitamin C after a test dose of six Redoxon tablets. In each case a deficiency of vitamin C was reported. The following are clear-cut examples of scurvy and sprue.

CASE 10.—A ship's engineer was treated for sprue in 1926. He had had it for over a year, during which time he had lost 64 lb. in weight, and subsisted mainly on tinned milk. Soon after his admission to hospital definite signs of scurvy appeared, including bleeding gums and a typical purpuric rash on legs and thighs. The addition of orange-juice to the dietary led to an instant improvement in the rash and in his general condition.

CASE 11.—A man, aged 65, was treated for a relapse of sprue in 1932 and had lost 42 lb. in weight. After a month's dietetic treatment in hospital he developed scorbutic purpura, consisting of a rash on both legs, with spongy bleeding gums and deafness. A diet of orange-juice, strawberries, and bananas was instituted, and he made a good recovery and eventually regained his original weight—13 st. 6 lb.

Deficiency of vitamin-B_2 complex.—Emphasis has already been laid on the difficulty of differentiating sprue from pernicious anæmia in the tropics, and early cases of pellagra may be indistinguishable from incipient sprue. The following case, which reacted to nicotinic acid, appeared to exhibit features of pellagra, sprue, and idiopathic steatorrhœa, and it is difficult to decide which was the dominant factor.

CASE 12.—A man, aged 40, who had lived in Southern Rhodesia for eighteen years and had a sprue-like history of fatty diarrhœa, glossitis, angular stomatitis, emaciation, pigmentation, and anæmia. Especially noticeable were the atrophic perianal skin, parchment-like hands, and washerwomen's fingers. The tongue (fig. VIII) resembled that of early sprue, with marginal indentations. The fæces were sprue-like, bulky (90 oz.), and fatty (fæcal fat 50%). In the megalocytic anæmia, with poikilocytosis and anisocytosis, the flat oral-glucose curve, and the low serum-calcium his condition resembled sprue, but a barium enema showed a considerable degree of megacolon, suggesting idiopathic steatorrhœa; and his external appearance, especially the pigmentation and phrynoderma (toad-skin) of the elbows and knees, suggested pellagra. There were no signs, however, of osteoporosis.

That the main deficiency was of vitamin-B_2 complex was seen by his reaction to massive doses of nicotinic acid, and that this deficiency was dietetic was shown by the fact that he had been subsisting mainly on tinned and other preserved

foods. His reaction to treatment resembled that of pellagra inasmuch as the diarrhœa and skin manifestations cleared up with nicotinic acid, and the anæmia with injections of campolon and with blood-transfusions; but a relapse took place, after which nicotinic acid 300 mg. daily was required. Eventually, after six months' treatment, the colon was reduced to normal size, as shown by a barium enema. The glossitis was cured and the appetite and taste sense were restored soon after the start of treatment with vitamin-B_2 complex.

COMMENTS

In the present state of knowledge it is impossible to envisage the exact manner in which these various syndromes are related; but it is clear that there exists some common link or chain connecting them. The known factors have already been described, and the clinical pictures are sufficiently distinct to enable the conditions to be differentiated as shown in the table.

ÆTIOLOGICAL CLASSIFICATION OF DISEASES CHARACTERISED BY GLOSSITIS

Ætiological factors	Syndrome	Possible contributory factors
PELLAGRA		
Deficiency of P.P. factor:—		Bacillary dysentery, amœbiasis, intestinal tuberculosis, chronic alcoholism, and other chronic intestinal diseases, including sprue and idiopathic steatorrhœa.
(1) nicotinic acid	Glossitis, dermatitis, and changes in spinal cord	
(2) riboflavin (lactoflavin)	Cheilosis (angular stomatitis)	
TROPICAL SPRUE		
(1) Specific factor (virus ?)		Previous intestinal infection
(2) Deficiency of extrinsic and intrinsic factors of pernicious anæmia	Megalocytic anæmia	
(3) Deficiency of vitamin-B_2 complex	Glossitis and rarely changes in spinal cord	
ADDISONIAN PERNICIOUS ANÆMIA		
(1) Deficiency of extrinsic and intrinsic factors of pernicious anæmia	Megalocytic anæmia	
(2) Deficiency of vitamin-B_2 complex	Glossitis and changes in spinal cord	
IDIOPATHIC STEATORRHŒA		
(1) Congenital defect		Cœliac disease
(2) Deficiency of vitamin D	Osteoporosis, hypocalcæmia	
(3) Deficiency of vitamin-B_2 complex	Glossitis, stomatitis, megacolon	
(4) ? Factors of pernicious anæmia	Megalocytic anæmia in some cases	
NUTRITIONAL MEGALOCYTIC ANÆMIA		
Nutritional (absence of extrinsic factor).	Glossitis and megalocytic anæmia	Pregnancy and malaria

It is difficult to believe that tropical sprue originates in the tropics alone, unless the local conditions comprised some initial and decisive factor, such as a virus capable of initiating peculiar changes in the intestinal tract. Sprue may eventually prove to be a secondary clinical manifestation grafted on something else, just as pellagra is so often superimposed on some other chronic intestinal disease—e.g., intestinal tuberculosis and chronic bacillary dysentery. One of the great difficulties in the acceptance of a sprue virus indigenous to the tropics lies in the extraordinary latency which sprue may exhibit. As has been recorded on many occasions, and in one of the series described here, sprue may arise de novo in persons who have resided in England ten to twenty-five years after quitting the endemic area. This is difficult to explain unless the clinical picture of sprue unfolds very slowly through the successive deficiencies, due either to destruction or to non-absorption, of the various vitamins or other factors. If this is true it is no more difficult to grasp than the idea that idiopathic steatorrhœa in the adult represents the successor of cœliac disease in infancy.

There is no real difficulty in differentiating fully developed pellagra from sprue, but in borderline cases the differential diagnosis is difficult. It is hard to say where pernicious anæmia begins and tropical sprue ends, or where idiopathic steatorrhœa ends and pellagra begins, or where larval pellagra merges into sprue.

It must be borne in mind that, because we are dealing with substances such as the vitamin-B_2 complex, whose actions are under trial and range of activities to some extent speculative, it is impossible to pass any judgment save according to the end-results of their therapeutic effects; but even this method is limited by the fact that the therapeutic agents employed—e.g., liver extract—have an action which may be multiple and may act in a different way in different diseases.

SUMMARY

This paper is based on clinical observations made with the object of disentangling the ætiology of tropical sprue and allied diseases. It has been shown that glossitis, probably of a similar nature and non-specific to the disease, is found in pellagra, sprue, pernicious anæmia, the nutritional anæmias, and idiopathic steatorrhœa, and that through this and other features, such as changes in the spinal cord, these diseases are closely related to one another. It is therefore suggested, on analogical as well as therapeutic grounds, that a deficiency of the vitamin-B_2 complex, which appears to be common to all, may partially explain these phenomena. It is further suggested that nicotinic acid and riboflavin play an important part in the treatment of sprue as well as of pellagra, pernicious anæmia, subacute combined degeneration of the cord, and, to some extent, of idiopathic steatorrhœa.

It is further shown that these diseases are so closely related to one another that borderline cases are often encountered embodying the salient features of two or even more of the group. The opinion is therefore expressed that this group of diseases has as many affinities in common as there are factors involved (some of which may still be obscure); and that the clinical picture of any one of them varies with the presence or absence of any one or more of these factors.

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MECHANISM OF CEREBRAL CONCUSSION

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Cerebral concussion has been defined by Trotter as an essentially transient state due to head injury which is of instantaneous onset, manifests symptoms of a purely paralytic kind, does not as such comprise any evidence of structural cerebral injury and is always followed by amnesia of the actual moment of accident.

In this paper I have attempted to account for the phenomenon of concussion on a physical basis which is in harmony with our present knowledge of cerebral metabolism. To do this we must explain how momentary traumatic violence can so profoundly affect the normal nervous mechanisms of the brain as to give rise to a succeeding paralysis considerably outlasting the period of cranial deformation; but which is also essentially transient and not accompanied by permanent structural damage to the central nervous system.

Several explanations for cerebral concussion have been advanced. It has been supposed that a wave of pressure may be transmitted through the cerebrospinal fluid from the site of the injury to the nerve centres concerned, producing changes in the colloidal structure of the cells which are responsible for the loss of consciousness. How such an impact to the nerve-cells can produce these changes is, however, obscure. Like insult to other tissues is not followed by any similar cessation of function.

Again, it has been suggested (Greenfield 1938) that deformation and stretching of the nerve-fibres as a result of a change of cranial shape accounts for the dislocation of nervous function seen in concussion. It is, however, hard to imagine that the stretching of central axons and dendrites could produce such a temporary interruption, when stretching of peripheral nerves of sufficient degree to interfere with nervous impulses is followed by so prolonged disablement.

Trotter (1925) has put forward the ingenious theory that concussion is due to acute compressional anæmia. This supposes that a wave of increased pressure penetrates the perivascular continuations of the subarachnoid space, causing immediate collapse of the cerebral capillaries with concomitant anoxia of the brain cells. Ritchie Russell (1932) points out that this theory fails to account for the fact that the symptoms of concussion so often considerably outlast the incident of violence. Moreover, the signs of concussion differ in some respects from those of acute deprivation of oxygen due to other causes. Thus, in Stokes-Adams attacks and in cyanide poisoning irritative symptoms such as clonic spasms and convulsions are sometimes observed. These are never seen in concussion.

THEORY OF FLUID DISPLACEMENT

It seems likely that traumatic violence to the skull, which causes momentary diminution in intracranial volume, compresses the brain and may thus drive the cerebrospinal fluid out of the perivascular and perineuronal spaces in the same manner as fluid may be squeezed from the interstices of a sponge. In this way some of the cells of the brain are instantaneously deprived both of their fluid environment and also of the all important food substances contained therein. Now the cells of the brain contain but scanty intracellular food reserves; cerebral metabolism consists almost entirely in the oxidation and glycolysis of glucose which is directly supplied to the cells by their environment. In the absence of added substrates the rate of absorption of oxygen by the brain falls to a low level and the glycolysis of glucose to lactic acid quickly ceases. Glucose is normally supplied to the neurones by the cerebrospinal fluid which bathes the cells. This cerebrospinal fluid is present in the perivascular prolongations (Virchow-Robin spaces) which envelop the cerebral blood-vessels. If cerebral concussion involves displacement of this fluid and collapse of these spaces, then the neurones would immediately be deprived of glucose which is their main metabolic substrate. Sudden interruption of cerebral metabolism would be the result.

Recently it has been suggested that nervous activity is dependent on the glycolysis of glucose to lactic acid by the cells of the brain (Dixon 1940). Glycolysis in the cerebral cortex is increased under conditions where activity is increased, and is inhibited where activity is inhibited. It thus seems possible that the loss of consciousness and the other paralytic signs of concussion are similarly dependent on inhibition of glycolysis. It is certain that if displacement of cerebrospinal fluid away from the brain cells takes place in concussion the katabolism of glucose would come to a standstill. It is reasonable to suppose that under such conditions nervous activity would simultaneously be dislocated. The rate of return of nervous function would depend on the speed with which the cerebrospinal fluid can percolate back into the perivascular spaces, restoring the supply of glucose to the cells. It is conceivable that equilibrium may be but slowly attained, and that diffusion of fluid containing glucose from the blood-vessels into the collapsed perivascular spaces would be an important factor in restoring glycolysis in the cells and reinstituting nervous activity. Thus the variable period of recovery from concussion would depend on the rate of return of fluid along the perivascular spaces and also on the rate of refilling of these spaces by diffusion of fluid from the blood-stream. This latter factor would be determined by the blood-pressure and the osmotic pressure of the blood. In a shocked patient with a low blood-pressure and a highly concentrated blood-plasma consciousness might never return. This suggests that intravenous injection of dilute glucose solution might be an efficient means of treatment where signs of recovery are delayed.

The theory of fluid displacement accounts for the instantaneous onset, the variable period of duration and the transient nature of the symptoms and signs of cerebral concussion. It also explains why concussional interruption in function is peculiar to the central nervous system. In other tissues and organs the nutritive fluid bathing the cells cannot similarly be displaced from their vicinity by traumatic violence.

SUMMARY

It is suggested that concussion is due to compressional displacement of the nutritive cerebrospinal fluid from the interstices of the brain along the perivascular continuations of the subarachnoid space; this would deprive the neurones suddenly of sugar, which is essential for their normal action, and would thus be responsible for the transient interruption of cerebral function seen in concussion.

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INTRAVENOUS INSULIN IN THE TREATMENT OF SCHIZOPHRENIA

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It seemed desirable to compare the effect of intravenous insulin with the usual intramuscular method of administration in the insulin coma treatment of schizophrenia for the following reasons.

Occasionally intramuscular insulin is absorbed so slowly that hypoglycæmic symptoms may develop long after the day's treatment is finished (one patient passed from normal sleep into coma, in which state she was discovered at 4 A.M., 16 hours after the termination of an apparently normal coma treatment); the length of time required to induce coma might be shortened; cases which proved to be coma-resistant might be rendered comatose if the insulin were introduced directly into the blood-stream; during a long war supplies of insulin may run low and any method of treatment which lessened the amount of insulin required to produce a desired effect might be useful.

The first step was to compare the nature of the hypoglycæmic response obtained by using the two methods of administration. For this purpose 7 patients showing a characteristic schizophrenic picture were chosen and given intramuscular insulin treatment after the now more-or-less standardised method of Sakel. The treatment was continued for several weeks, so that the optimum coma dose of insulin could be established, and the patients were then given increasing doses of insulin intravenously until the coma dose was reached; this was found in every case to be the same as the amount required to produce coma when injected intramuscularly. Tables I and II give a comparison of the two methods of insulin administration. Coma was judged to be present when there was no voluntary response to external stimuli, extensor plantar response was present and the corneal reflex was absent.

It will be seen that the blood-sugar reached its lowest level 1–2 hours after intramuscular insulin, while with intravenous insulin the lowest level was reached in 30–45 minutes. Moreover, the onset of coma followed more

TABLE I—TIME REQUIRED FOR PRODUCTION OF COMA WITH INTRAVENOUS (I.V.) AND INTRAMUSCULAR (I.M.) INSULIN

Case	Units of insulin	Time for production of coma (min.)		
		I.V.	I.M.	Difference
1	100	130	205	75
2	60	145	205	60
3	200	150	210	60
4	140	150	200	50
5	60	170	210	40
6	120	170	185	15
7	90	210	215	5

quickly with intravenous than with intramuscular insulin; the reduction in time ranged from 5 to 75 minutes with a mean of 43 minutes.

A case known to be coma-resistant and insulin-resistant, which has been reported in some detail in a previous paper,[1] was treated next. This patient, who showed no clouding of consciousness after 300 units of insulin injected intramuscularly, was now given increasing amounts of insulin intravenously in an attempt to induce coma. Even 600 units given intravenously failed to produce coma, although at this level there was drowsiness and he was able to obey only simple commands; but 4 hours after the injection he was able to help himself to a glucose drink. After 600 units of insulin the blood-sugar readings were: fasting, 99 mg. per 100 c.cm. of blood; 15 min., 95; 30 min., 56; 45 min., 34; 60 min., 31; 75 min. 31; 90 min., 32; 120 min., 32; 150 min., 41; 180 min., 50; 210 min., 31; 240 min., 34. As one would expect, the degree of hypoglycæmia did not vary significantly with doses ranging from 100 to 600 units of insulin.

1. *Proc. R. Soc. Med.* 1939, **32**, 958.

DISCUSSION

The results obtained by the use of intravenous insulin treatment indicate no particular advantage for this form of administration compared with the more usual intramuscular route. Certainly there is no economy in the amount of insulin required to produce coma, but the time before the onset of coma was shortened. It is doubtful whether the amount of insulin used in this country for this particular treatment can be regarded as a serious drain on the essential supplies of insulin, as Dr. R. D. Lawrence[2] has suggested, and the same argument applies to the sugar needed for the interruption of coma, but Russell Fraser working at this hospital has found that sugar can be largely replaced by starch for the interruption of coma.

Possibly some modification of the usual treatment might be employed. I have obtained good results by carrying out the ordinary procedure up to the development of the first coma, and thereafter interrupting treatment at the stage at which definite symptoms of hypoglycæmia appeared, 60–90 min. after the intramuscular injection of insulin. The number of cases treated in this way was insufficient to justify any comparison with the ordinary coma treatment, but the results suggest that the production of coma per se is not the essential therapeutic factor, but that the necessary hypoglycæmic effect on the tissues may be obtained even if coma is not allowed to develop. All workers in this field have treated cases which, while coma resistant, have reacted favourably to insulin treatment. It is possible that an adequate tissue effect might be obtained with economy in insulin if increasing amounts of insulin were given intravenously until a dose which produced a maximal hypoglycæmic effect after 3 hours was reached. A maximal hypoglycæmic effect is obtained by using as little as 0·1 unit of insulin per kg. of body-weight, but there is a return to fasting level within 2 hours, and considerably larger doses would be necessary to maintain the maximal fall for as long as 3 hours.

TABLE II—BLOOD-SUGAR LEVELS IN MG. PER 100 C.CM. AFTER INSULIN

Case	Route	Fasting	Number after injection—									
			15	30	45	60	90	120	150	180	210	240
1	I.M.	108	102	72	58	36	34	36	36	36	34	31
	I.V.	86	34	20	19	17	17	19	27	—	—	—
2	I.M.	97	84	83	63	32	32	27	27	31	—	39
	I.V.	106	—	36	31	31	24	31	31	—	—	—
3	I.M.	95	84	56	48	38	34	34	34	34	36	36
	I.V.	102	74	50	31	29	31	38	39	39	—	—
4	I.M.	118	94	78	68	50	50	30	30	26	27	—
	I.V.	102	88	47	34	34	25	17	17	20	—	—
5	I.M.	92	77	63	50	45	38	31	31	31	31	31
	I.V.	92	59	34	34	34	34	36	32	32	—	—
6	I.M.	99	92	59	47	24	31	32	32	27	29	—
	I.V.	102	88	41	31	27	27	27	25	29	—	—
7	I.M.	104	92	70	45	32	25	25	27	31	34	34
	I.V.	108	74	34	24	22	22	24	24	27	27	—

SUMMARY

To induce coma the same amount of insulin is required by the intravenous as by the intramuscular route.

Coma is produced more quickly by giving insulin intravenously than intramuscularly. In 7 cases the average shortening of time was 45 minutes.

One patient who was coma resistant remained resistant to intravenous insulin, even when 600 units was given at one time.

The possibility of economising in insulin and glucose in carrying out insulin treatment of schizophrenia is discussed.

This work was done at the Maudsley Hospital, London, and I would like to thank Dr. Aubrey Lewis, clinical director at that hospital, for his help.

2. *Brit. med. J.* July 20, 1940, p. 98.

Reviews of Books

Fetal and Neonatal Death

By EDITH L. POTTER, M.D., Ph.D., instructor in the department of obstetrics and gynæcology, University of Chicago; and FRED L. ADAIR, M.D., professor and chairman of the department. London: Cambridge University Press. Pp. 207. 9s.

IN the United States the stillbirth-rate is now 35 and the neonatal death-rate 31 per 1000 live births, and the reduction of these by a third to a total of 40 per 1000 would mean a saving of 55,000 lives a year. Dr. Potter and Prof. Adair believe that this is possible. In Britain, too, the stillbirth-rate and neonatal death-rate have not fallen like the deaths in the rest of the first year, and a mass attack on the problem is long overdue. This book has therefore come at an opportune moment. The subject is presented methodically. The first chapter is a statistical review of birth-rates and stillbirth-rates in the United States. The relative frequency of prematurity, birth injury, anoxæmia, infection, and exposure to unfavourable conditions of external environment immediately after birth are next considered. The detailed causes of death are compiled from the statistics of large maternity hospitals, where great care was taken by post-mortem examination to make an accurate diagnosis. Chapters on the anatomy and physiology of the normal fœtus at various stages of development, post-mortem methods and the special pathology of the individual fœtal organs complete the book. It will prove valuable to anyone—midwife, medical man or legislator—who wants to have a clear picture of the causes of stillbirths and neonatal deaths and of their relative importance.

Dermatologic Therapy in General Practice

By MARION B. SULZBERGER, M.D., assistant clinical professor of dermatology and syphilology in the skin and cancer unit of the New York Post-graduate Medical School and Hospital of Columbia University; and JACK WOLF, M.D., associate attending dermatologist at the hospital. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. Pp. 678. 22s. 6d.

THE senior author of this admirable compilation has been, since 1931, the co-editor with Dr. Fred Wise of the new indispensable Year Book of Dermatology and Syphilis, and there is no-one better qualified to estimate the requirements of the practitioner whose experience in this branch of medicine is so frequently inadequate. But the scope of the book—limited though it is to the treatment of the commoner skin diseases—is much greater than the title suggests; for in addition to concise and practical notes on treatment we are offered precise descriptions of the clinical symptoms, ætiology (when known), differential diagnosis and prognosis in each of them. Sixty-five photographic reproductions lend life and colour to the text and justify the dictum that one picture is worth a thousand words. Besides the general index there is a subsidiary index of prescriptions in which the authors have endeavoured to confine themselves to tried remedies. Their recommendations are obviously based on personal experience and are liberally interspersed with do's and donts. They quote Stoke's four cardinal points in the diagnosis of scabies: the burrow, nocturnal itching, distribution of the eruption and an identified source of infestation. They remind the reader that scabies is often a familial disease, and that this has a bearing on diagnosis and treatment; every case should receive written or printed instructions for there is no condition in which exact compliance is so essential if a rapid cure is to be achieved. They give a choice of four simple prescriptions, which can be varied according to the age of the patient and the particular characters of his skin and conclude with a warning that "if dermatitis supervenes, or itching persists, further antiparasitic treatment can only aggravate the symptoms." It is worth recalling that most of the skin casualties treated at a base hospital in France between 1916 and 1918 were examples of neglect of this admonition. The increasing complexity of drug eruptions is illustrated by photographs and simplified by a detailed tabular representation of their essential features. The general index could be amplified with advantage.

Electrocardiography

(3rd ed.) By C. C. MAHER, M.D., and P. H. WOSIKA, M.D., M.S. London: Baillière, Tindall and Cox. Pp. 334. 22s.

IN the hands of the inexpert the electrocardiograph too often leads to wrong conclusions, and this book, written for the general practitioner, the student and the physician who is not a cardiologist, will do little to reduce the danger. Too much attention is paid to minor variations of the QRS-T component; to interpret them as signifying myocardial damage is misleading. If a patient is supposed to have coronary sclerosis on clinical grounds then almost any electrocardiographic abnormality would appear from this book to be corroborative evidence. This is not only dangerous but sterilising. Of 27 electrocardiograms illustrating the changes found in hypertensive heart disease there is but 1 showing the classical features of left axis deviation with depression of the RS-T segment and inversion of the T wave in lead 1, and neither the description of this record nor the text mention the depression of the RS-T segment which is the essential characteristic. More mention should have been made of those conditions on the borderline of cardiology which may produce an almost diagnostic electrocardiographic pattern, such as myxœdema, severe anæmia, pericardial lesions and pulmonary embolism. The authors have wisely refrained from laying too much emphasis on lead 4, and have avoided the complexities involved in multiple chest-leads, for these must still be the preserve of the cardiologist.

The book is well produced, clearly illustrated and supported by a comprehensive explanatory text which those for whom it is intended will have no difficulty in following.

Applied Pharmacology

(7th ed.) By A. J. CLARK, M.D., F.R.C.P., F.R.S. London: J. and A. Churchill. Pp. 657. 21s.

No-one should take up the study of pharmacology lightly. Such are its ramifications that the student must be prepared to refresh his knowledge of physics, chemistry, physical chemistry and physiology, and to anticipate his knowledge of therapeutics if he is to get full return for his pains. Undoubtedly he should accept Shelley's encouragement to look before and after, and pine for what is not. And there is at least one writer who will not let him down. Professor Clark has aimed to bridge the gap between pharmacology and therapeutics, and the appearance of seven editions within a few years is the token of his success. He would we think agree that his book should not be used by the junior student to the exclusion of standard works; it is a complementary volume. In this edition new chapters have been added on the action of the sulphonamides and the pharmacology of the hæmopoietic system; other changes reflect recent advances in our knowledge of hormones, vitamins and immunology.

Landmarks and Surface Markings of the Human Body

(8th ed.) By L. BATHE RAWLING, M.B., F.R.C.S. London: H. K. Lewis. Pp. 98. 8s. 6d.

"TIS but thy name that is my enemy." Many a student of anatomy, wrestling with the various terminologies, might find in Juliet's words the expression of his own feelings. But whatever may be our opinion of the new terms, nothing is gained by deriding them or trying to ignore them, for nowadays they are taught to most medical students and they have certainly come to stay and perhaps to supplement the older systems—though it will be many years before the time-honoured names are no longer employed. Mr. Rawling did wisely to introduce the British revision of the B.N.A. terminology into this new edition of a book which is used mainly by preclinical students. He was also wise to retain as alternatives or in brackets some older terms which are classical, for they are still part of the language of surgery. Apart from the change of terminology the new edition shows no significant changes; it retains the first-class qualities which have made it popular—the clearness and conciseness of the text, and the lucid simplicity of the diagrams.

In England Now

A Running Commentary by Peripatetic Correspondents

THE big raid of Saturday afternoon, Sept. 7, which started the fire in dockland, ended just before seven, and we went up to our High Road to see what we could see. Everyone else was already there. The street was packed with people, who from the amount and rapidity of their conversation and the freedom with which they talked to strangers could be seen to be excited. The traffic note, too, had that high pitch which means excitement in London. We had counted 22 fire-engines go by as we walked the two hundred yards to the main road, and anything up to another 20 passed in the short time we were there. There was nothing to be seen except a vast mass of smoke rising from over the high ground towards London. Being yet light it didn't glow. My wife thought we had better get another small loaf of bread in case there was not enough over the week-end. Apparently many had thought the same, for the bread shops were all packed just at closing time. The warning went again just as the blackout started. Our funk-hole is in the hall under the stairs. Our servant Mary, small and deaf, fits into the oddment cupboard in a deck chair; the wife in a chaise longue goes into the coat cupboard with her toes just sticking out; and I with my greater bulk am squeezed into an improvised bunk in the hall recess. There we stayed throughout the night, hearing the noise, sleeping somewhat but not much, until 5 A.M. when the all-clear sounded and we went up to bed for a short further sleep. It is characteristic of the German failure to recognise the first points of enemy psychology that they did this first in London on the Saturday night. It was a staggering blow, but London had the day of rest to recover from it, to prepare for it again, and to think over its lessons; and right well did London use that day. By the evening we were ready to face another night of it and yet do our day's work on the morrow. On the fourth night I had the priceless chance of sleeping out of London, and I was surprised myself at the effect the little interval had on me. It was not that I had been jumping at every noise—that has become a conditioned reflex since the last war—it was the small things that gave me away, like leaving coats behind in two hospitals to which I had been in twenty-four hours, or leaving oddments that take no time undone until they had multiplied into a great labour. On the fifth night the firing became far more intense, but, perhaps as some say because it was our own noise this time, I slept through it and did not hear the all-clear.

The daylight raids have not affected me, presumably because no bomb has dropped near me, though a time-bomb went off between two operations one evening. I thought it was on the roof of the operating-theatre, though actually it was outside the hospital confines. They make it advisable to start out in the morning in good time, but when, as on Friday, the siren goes at 7.45 A.M. this isn't easy. Mostly the day raids raise questions of administration. Must all the shops shut? Is it essential for the eating houses to turn out their customers into the streets, their meals half eaten and therefore wholly unpaid for? Is it necessary to shut the tube stations during every raid, or might the time be used to get the people to their work or still more to get them away again?

* * *

As one wanders round London now the first thing one notices is its vastness. Street after street looks just as it did in peace-time, then you turn the corner and see havoc. The second thing is its resistance. You start off in the morning and some street is obstructed—your tram cannot run or your bus must be diverted—but by evening things seem to be normal again. There is a spirit of adventure in a journey. Your tram is not running, so you jump on a bus which should go over another bridge than yours and it lands you close by where you wanted to go. You do the same next day and are left at a bridge two further west than the one you wanted, and have to walk back along the river. In writing thus it must not be thought the injury is not severe; it is serious but not grave, to apply a contrast that a revered senior used to use to parents of a sick child. When you come on a damaged street it is not the big buildings that seem to matter. At the corner of one bridge the half of a great city company is a shell still smoking after nearly a week. At the corner of another the treasurer's house of a great hospital has poured itself on to the roadway. But it is when you see a little dwelling cut away from its fellows and all the others damaged that the full tragedy strikes you. These are the homes of the people. There is nothing left of the contents of the house that has been excised; but the possessions of the others are stacked in the street covered by tarpaulins supplied by the borough council. The greatest thing of all is the heroism of the people. Not those who think themselves important, like doctors, nurses, bank managers and lawyers, but the clerks, porters, scrubbers and office-boys who enable us to do our work. They are taking things quietly but firmly; there is little laughter and what there is is neither boisterous nor prolonged. Faces are set but not many are strained. We are in for a hard winter and there will be sickness among those that have lost their houses or had them changed to open-air residences and also among those who spend half their lives in shelters. Every bit of help in money or in personal service will be needed, but our vastness, our resistance, and the heroism of our little people make us invincible.

* * *

Although the morse code does not appear in the medical curriculum, an elementary knowledge of it and the international code of signals can play an important part in a doctor's life if he is called out to sea in war-time. In the earlier days of the war I undertook many urgent calls to ships without an adequate knowledge of either, and at least twice ran into serious and unnecessary danger through this ignorance. The third occasion made a sad dent in my professional reputation. The scene opens on a fine gusty morning with the sun shining down on about a hundred ships scattered over twenty square miles of anchorage. Amongst these is a Yugoslav vessel urgently requiring medical assistance, but the message received from the naval base gives no indication of its position and a careful search with binoculars from the shore gives us no clue. We launch a small boat and commence a search about three miles out. Usually the easiest way of spotting ships is their national flag, but none of us knew what a Yugoslav flag looked like. After a fruitless visit to several Greeks, two Portuguese and an Esthonian tramp, we hailed a trawler which was coming up fast astern. The skipper made a "washout" signal with his hands, but in reply to our second series of yells changed this to a kind of "follow me" gesture. This seemed hopeful so we trailed after him like a lamb. A few minutes later he waved his hands and shouted at us, then began to blow the letter U · · — · · — on his hooter. This meant less than nothing to us, so we kept going almost on top of a large floating mine. The coxswain put the rudder hard over and nearly capsized us just as the nearest guardship opened up rapid rifle fire on the beastly thing. Our progress away, about three knots against the flood tide, was speeded by ricochets moaning past our tail while one of Lloyd's agents and myself stood in the bows with our fingers in our ears waiting for the bang and the old boatman crouched over his engine, wiping the sweat from his forehead with one hand and pushing the throttle hard over with the other, urging us on with a reiteration of "Get on, you . . . !" "Get on, you . . . !"

Fortunately for us the mine sank without exploding and shortly afterwards we found our ship and landed a case of acute appendicitis. After removing this I went home and looked up the code of signals. It said: "U—You are standing into danger."

The next episode occurred on a pitch-dark night after a message from a south-east port that a ship was dropping out of convoy to land a case of appendicitis. As before, no indication of position was available and no helpful lights could be seen from the shore. We assumed that the southern part of the anchorage was a likely field, and began a ship-to-ship search in this area. After an hour or so of this, in desperation I took out my pocket torch and flashed "doctor." This brought an instant response from every naval vessel in the neighbourhood to "Put that . . . light out!" As a last hope I repeated the signal and a destroyer ahead flashed the

letter K — · —. We assumed this to mean "all correct" and hastened on. A little later an examination tug flashed her searchlight out to sea and showed up a long black shadow about a mile farther out which turned out to be our quarry. I took off her chief officer to hospital and extracted his appendix forthwith. It was the next day when I asked him as a matter of interest what the letter K really meant. He said, "Oh, it means 'Stop instantly, or I fire!'"

* * *

The last occasion followed a day of fruitless search for an Italian ship in a crowded anchorage. At last the naval base located her about four miles out and telephoned me the position after dark. It was a rough night, and having launched I realised that the all-important duty of warning the coastguard had been omitted. Seeking to remedy this, I stood up with my torch at arm's length and called them up "Z Z Z Z Z." After the answering "T" I began my message: "*Dr.— going to Si—*" At this point, about two miles out, we struck a patch of foul water and I went flying. Having picked myself up I started again "*Silv—*" only to be sent headlong once more. This happened several times until at last I managed to complete the word "*Silvano*" and signed off with the usual: "AR." Having completed the job, a minor operation in the captain's cabin, we landed after waiting an hour for the swell to abate a little, and I reported my return in person to the coastguard about 1.30 A.M. The men on duty looked at me in a curious way and one said: "You weren't quite yourself this evening, doctor, were you?" They didn't realise what was happening in that nasty little boat. But it is perhaps the first recorded case of anyone hiccuping in morse.

* * *

Having seen, in an outlying village, a patient whose case I wished to discuss with a consultant I repaired as usual to the combined post office and general shop from which for the past decade I have been accustomed to telephone. I tendered my sixpence to my friend the shopman. "Zorry, zor," he said, "but you can't telephone no more from yur. You'll 'ave to use the keye-osk yonder." He indicated a new and repellent-looking red sentry-box a gunshot away. Arrived there I dialled O and waited an unconscionable time before attracting attention, and after further delay was told pertly to put sixpence in the box. I did so. It rattled through the machine and reappeared through the cloaca at the base. "The machine's out of order," I said. "I expect your sixpence is too smooth," said the pert voice. "Have you another?" "It isn't smooth at all," I replied, "but it so happens that I have another." I inserted the second sixpence and a second precipitate labour ensued. "What now?" I asked. "I'm afraid you'll have to put in six pennies," said the voice. "But that means going back to the shop for change," I objected. "Sorry," said the voice—very unconvincingly I thought. I returned from the shop laden with copper currency. Once more I lifted the receiver, and after the inevitable interval was asked what number I wanted. Time passed. "Six pennies, please," said the voice at last. I inserted one. There was a rumbling in the bowels of the black box and my penny hastily discharged itself, followed in quick succession by two more. Fascinated, I inserted another which also was summarily ejected in company with three others. I now had elevenpence and unwisely boasted of my good fortune to the voice. "I'm afraid the machine must be out of order," it said. "You're telling me," I replied, "but what about my call?" "I can't put you through, I'm afraid." I blustered and finally the voice consented to put me through on the condition that I handed over my sixpence plus winnings to the shopman who was to ring up immediately afterwards and acknowledge receipt of it to the exchange. Needless to say the consultant was out. This, they say, is a war of machines. I suspect the Fifth Column must have been at work on this one.

NURSE ANÆSTHETISTS

Dr. F. B. Parsons, hon. secretary to the medical and surgical staff of Addenbrooke's Hospital, Cambridge, has addressed the following reply to the President of the Association of Anæsthetists of Great Britain and Ireland, whose letter appeared on p. 307 of our issue of Sept. 7.

SIR,—The honorary staff of Addenbrooke's Hospital feel that the grave misgiving felt by your committee may perhaps be mitigated if the following facts are brought to your notice. With the outbreak of war, five of the eight hon. anæsthetists to this hospital were mobilised and left the district. They were in general practice in the town, and their work has largely been carried on by other practitioners, including the three remaining hon. anæsthetists. In addition to this reduction in the anæsthetic staff, the beds at Addenbrooke's Hospital and its annexe have already been increased by more than 140, and a further 150 is in contemplation. In the past, qualified resident anæsthetists have been forthcoming, but they have been liable to be called up by the Services and gaps between appointments have been inevitable. Although we have had for the most part very efficient officers for this appointment, yet there have been occasions when difficulty has been encountered in filling the office, and inevitably some inexperienced anæsthetists have been encountered.

At the present moment training of students in the administration of anæsthetics at the London hospitals cannot be ideal, and cases are known of qualified men who have been unable to give more than one or two anæsthetics under supervision before qualification. Furthermore the Central Medical War Committee, in their circular D.77 of July, 1940, have asked all hospitals as far as possible to give house-appointments to the newly qualified in preference to the more experienced applicants. The honorary staff therefore felt that the training of its own anæsthetists for long-term appointments (2–3 years) was worthy of consideration. Some of this staff have considerable experience of these sister-anæsthetists in the U.S.A. and on the continent of Europe, and members of the staff of a large hospital in East Anglia gave their opinion of the value of this personnel, which it was stated had been functioning there for many years with entire success.

In order to safeguard as far as possible the interests of surgeon and patient it has been decided that each sister-anæsthetist shall receive six months training—i.e., double that required for a registrable qualification as a medical man—and they will of course give (under supervision during this period) several hundred more anæsthetics than the number administered by a newly qualified practitioner. Only nurses who have held the post of sister in ward or operating-theatre have been chosen, and it is anticipated that at least two qualified medical men will be present in the theatre during the administration of the anæsthetic by a sister-anæsthetist.

With regard to your sentence: "These duties cannot properly be assigned to an unqualified person; that they had been so assigned, should accident befall (say) to a patient serving in His Majesty's Forces, would create public resentment which would bear heavily against the hospital concerned"—the staff feel that whether the patient be a civilian or a member of H.M. Forces is beside the point. What they are concerned with is the provision of an efficient and adequate anæsthetic personnel, both honorary and resident, ready to deal at a moment's notice with future casualties, civil or military, for which hospitals have been told to hold themselves in readiness.

At the risk of reiteration, the staff wish to make it quite clear that there is no intention of supplanting the honorary anæsthetists. Rather they hope to reinforce and to assist those who, in spite of considerable overwork in their own and their absent colleagues' practices, contrive loyally to give more than their usual time to the services of the hospital.

"... if pride of place had not been given to physics and chemistry in the scientific curriculum, rather than to biology, human beings would have been more interested in the study of life than in destroying it."—SIR WALTER LANGDON-BROWN, *Public Health*, September, 1940, p. 260.

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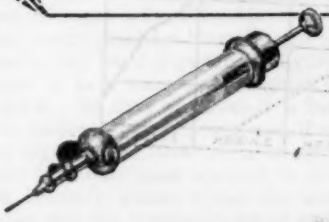

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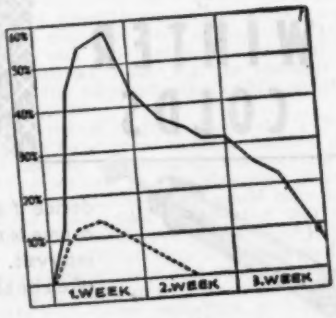

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THE LANCET

LONDON: SATURDAY, SEPTEMBER 21, 1940

SURSUM CORDA

Thou must be like a promontory of the sea, against which, though the waves beat continually, yet it both itself stands, and about it are those swelling waves stilled and quieted (Marcus Aurelius)—from the fly-leaf of Osler's Æquanimitas.

THE strongest causes of bad morale are fear, suspicion and disunion; the strongest antidotes are a keen sense of membership of the community and confidence in other members. This is the message of Dr. GLOVER'S timely exposition,[1] which is full of good common sense with a flavouring of more debatable assumptions. Fear and suspicion draw their strength from their vagueness. In Dr. GLOVER'S opinion this is to be traced back to the primitive fears of childhood. However that may be, the object feared will lose the greater part of its terrors when it is precisely known. This is the method of countering fears by rational means. If there had been general appreciation of the enormous weight of high-explosive bombs required to destroy completely a single acre of built-up ground, there need never have been those exaggerated fears once heard that the whole of London could be destroyed in a day or two of continuous bombardment. The anxious man who is inclined to imagine that every bomb is meant for him can reflect on the following simple calculation: if the whole of Greater London is indiscriminately bombed within a radius of 15 miles from its centre, it is a chance of 280,000 to 1 against any single bomb falling within 50 yards of him. The decision of the authorities to give full details of dangers passed and damage sustained is eminently sensible—the bulletin on the damage done to London on Sept. 7 must have brought reassurance to many, whereas mention only of "some" damage and "some" casualties would have added greatly to public anxiety and would have robbed millions of their faith in the accuracy of the news.

The importance of community sense cannot be too strongly underlined. A soldier has remarked that his worst moment was when his company received the order, every man for himself. In an instant he had become his own impotent individual self, and had ceased to be a member of a great and powerful organisation. In time of stress it is best for everyone to be under definite orders; and if a local breakdown of organisation does occur it should be made clear that it is only local and set in its due proportion. A Dunkirk soldier found the worst aspect of the retreat was the impossibility of striking back at the enemy. The civilian is unable to strike back in the way the airman and the A.A. gunner can; but he should be continually and forcefully reminded that his own job is an essential part of the battle. In Commander KING-HALL'S words, there are no civilians in total war. If anyone has not got a job, one should be found for him. Bad morale like good morale is infectious, and unemployment and enforced inactivity are as dangerous for psychological as they are for economic reasons.

The most powerful way of countering one emotion is by another; it takes an insane man to feel two contrary emotions at the same time. Positive feelings of pride and joy may be used to oust fear. Mr. J. B. PRIESTLEY'S recommendation that there should be as much life and gaiety as war-time conditions permit is on the right lines. Broadcasting on Sunday night he said: "As civilian life this is hellish, but regarded as a battle it is not so bad." Pride in one's position in the danger line and willingness for self-sacrifice, even joy in accepting punishment, are valuable emotions that can be fostered. People living in residential districts can feel that every time a bomb drops in their neighbourhood they have drawn the fire from an airfield or a factory. Another strong emotion—hate—Dr. GLOVER condemns as likely to lead only to disruption and frustration. Nevertheless there are many who find it necessary to hate in order to fight their best, and where hate has its ready and appropriate outlet its motive force is not entirely to be despised. But hatred is strongest where uncertainty is greatest, and the more confident we are of winning the less necessary we shall find it to hate the enemy, even in the impersonal way of hating a malignant organisation.

As there are psychological causes of bad morale, so are there physical. The irresponsible medical man who recently informed the press that three hours' sleep was enough for anyone should have known better. There are in key positions in many places over-conscientious individuals who have to be discouraged from overtaxing their powers. If we are to maintain efficiency at its peak we must constantly care for adequate nutrition and adequate rest.

1. Psychology of Fear and Courage. By Edward Glover, M.D. Harmondsworth; Penguin Books. Pp. 128. 6d.

ECCENTRICITIES OF IRON

FOR a generation and more the biochemist has tried—subject to change of fashion—to lay down a scheme of diets which would be equal to all contingencies. But it becomes increasingly apparent that he has barely touched the fringe of the problem of nutrition. For example, much research on protein metabolism will have to be revised if we accept the results of CUTHBERTSON and MUNRO, working in CATHCART'S laboratory. CATHCART [1] explains their work thus: if an ordinary mixed diet which eaten in four meals sufficed to keep an animal in nitrogen equilibrium is so divided that two of the meals consist of protein and fat and the other two of carbohydrate and fat, and if these two types of meal are eaten alternately, the equilibrium is upset and nitrogen is lost. Hard on the heels of this comes TOMPSETT [2] with somewhat comparable news about the behaviour of iron. He finds that ferric salts added to plasma will not pass through a semipermeable membrane unless the plasma is acidified, whereas ferrous salts will. The iron in the dialysate from acid ferric solutions was found to have been reduced to the ferrous state by something in the plasma. He concludes that ferrous iron is the only form absorbed from the alimentary tract, thus ranging himself with HEUBNER [3] and

1. Cathcart, E. P. *Lancet*, 1940, 1, 533, 586.
2. Tompsett, S. L. *Biochem. J.* 1934, 28, 1802; *Ibid*, June, 1940, 961.
3. Heubner, W. *Klin. Wschr.* 1926, 5, 588.

LINTZEL [4] against WHIPPLE and ROBSCHEIT-ROBBINS [5] and others, who take the view that ferric iron is absorbed as easily as ferrous iron. Ascorbic acid might seem a likely reducing agent of ferric iron in food, but TOMPSETT has found that many foodstuffs reduce it and is inclined to think that simple proteins are the active agents. Feeding experiments with mice show that egg-yolk added to a standard diet greatly reduces the absorption of iron while the white of egg slightly increases it. Moreover, a diet high in calcium tends to decrease absorption unless acid is added. Lest it be thought that eggs should be avoided in diets for the anæmic, it may be added that in whole egg the effect of the white preponderates.

It is as well to remember, as TOMPSETT points out, that in feeding experiments with animals every mouthful of diet has the same composition, which is not the case in human feeding. The practice of taking food in courses makes it possible to choose in what company a dose of iron shall make its way to the stomach. The absorption of food iron from the alimentary tract, he finds, is influenced by the gastric acidity, the calcium content of the diet, and the oxidation-reduction potential of the stomach contents. Besides aiding solution of the iron, the gastric acidity appears to intensify any reducing action that the diet may have. In a diet which is predominantly reducing, then, irrespective of whether the iron was initially in the ferric or ferrous state, its final state will be ferrous and as a result it should be absorbed easily. In a diet which is predominantly oxidising the final state of the iron will be ferric, which according to TOMPSETT is not absorbed. In achlorhydria the absence of gastric acid may be responsible for the development of hypochromic anæmia; but even in this condition the stomach contents have a weakly acid reaction, so that some part at least of the food iron should pass into solution and become reduced. Whether the amount absorbed is sufficient to prevent anæmia will depend on the iron requirements of the subject. In the presence of complicating factors such as these it is clearly impossible to enunciate any hard and fast rule about the minimum amount of iron necessary in the human diet. TOMPSETT'S opinion that absorption of essential food substances may be affected by mutual antagonism or "inhibition," and that a daily diet should be so arranged that mutual inhibition is reduced to a minimum, is interesting when considered alongside the findings on protein metabolism.

The background to iron absorption provided by TOMPSETT'S work offers a possible explanation of the well-known clinical experience that similar cases of hypochromic anæmia treated with the same doses of iron may recover at very unequal rates. Large doses are now given, especially of ferric salts; and if medicinal iron is taken after meals its absorption is subject to the same factors as the food iron, whereas if it is taken before meals absorption will be affected by the digestive secretions alone. There is no doubt that massive doses of iron salts are effective in the treatment of the iron-deficiency anæmias, but we may fairly ask how it came about that similar patients fifteen years ago were cured of their anæmia by doses of iron only about a quarter of those in use today; a few retired practitioners may be heard saying I told you so. It may be that we have had our attention fixed on dosage of iron to the exclusion of other factors which are just as important.

4. Lintzel, W. *Ergebn. Physiol.* 1931, **31**, 844.
5. Whipple, G. H. and Robscheit-Robbins, F. S. *Amer. J. med. Sci.* 1936, **191**, 11.

LIGHTING IN FACTORIES

WHEN Sir EDWARD GREY remarked prophetically "Lights are going out all over Europe and will not be lit again in our time," he probably had a spiritual rather than a physical blackout in mind. It is with the physical blackout, however, that the Departmental Committee on Lighting in Factories has to cope. In 1938 they published a report full of promising recommendations, but the war has altered factory conditions so much that these have had to be modified and after reviewing the position the committee have just issued a further report.[1]

At the beginning of the war, in compliance with the Lighting (Restrictions) Order, black paint was applied to the windows of many factories; this allowed no natural light to come into the workrooms during the day, and at night the windows had to be kept closed, with the result that ventilation was inadequate and in places where hot processes were carried on the conditions became intolerable. Improvements have, of course, been made steadily, and now in many factories which only work by day the windows have been cleaned and things have returned to normal; in other factories windows have been permanently darkened but the difficulties of ventilation have been overcome by providing fans or light-trap ventilators, according to the suggestions set out in the pamphlet "Factory Ventilation in the Black-out." [2] In most factories some natural light is admitted during the day and the committee believe that if the window area amounts to 12% of the floor area, work can be done during the day without using artificial light. But in war-time work is carried on for longer hours at greater pressure, and artificial light is now being used for 50 to 100% of the yearly hours of employment instead of 10 to 15%. The committee have not been able to make up their minds whether working in artificial light affects the health of the workers, although they lean, rather surprisingly, to the view that it does not. In any case they agree that a standard of artificial lighting in factory workrooms higher than that previously recommended is necessary in the interests both of the workers and of factory output. In rooms regularly occupied by workers a standard of not less than 6 foot-candles is recommended, the illumination being measured in the horizontal plane at a level of 3 ft. from the floor. Interior passages should be lit at floor level by not less than 0·5 foot-candle. The blackout regulations have nullified the previous recommendation of the committee that the illumination of the open yards of factories should not be less than 0·1 foot-candle; they find that workers can move about fairly well when the minimum street lighting standard of 0·0002 foot-candle is used, and when kerbs and other obstacles are painted white. For work of vital national importance higher

1. Fifth Report of the Departmental Committee on Lighting in Factories. H.M. Stationery Office, 1940, 3d. Signed by: Sir Duncan Wilson, C.V.O., C.B.E. (chairman); Brigadier-General A. C. Bayley, D.S.O.; John S. Dow, Esq.; Miss Florence Hancock; Sir John Parsons, C.B.E., F.R.S., F.R.C.S.; William Scholes, Esq.; G. W. Thomson, Esq.; J. W. T. Walsh, Esq., M.A., D.Sc.; H. C. Weston, Esq.; R. W. Daniel (secretary).
2. H.M. Stationery Office, 3d.

standards may be authorised by the senior police officers.

It is well known that work which involves discrimination of detail, such as fine engraving, type-setting, proof reading, and sewing on dark material, should only be done under a high standard of lighting. The committee have not been able to lay down definite standards for various classes of fine work, but they reprint as an appendix the code [3 4] recommended by the Illuminating Engineering Society. This table of lighting standards ranges from 2 to 4 foot-candles in places where casual observation but not specific work is done, to over 50 foot-candles for precise work and tasks requiring rapid discrimination. For fine machine work, proof-reading, and type-setting, a standard of 15 to 25 foot-candles is recommended. The committee recommend light coloured walls and ceilings to ensure adequate reflection. They discuss the prevention of glare, pointing out that it is not much use tinkering with an out-of-date installation and that the best course is to replace it with modern equipment. If their recommendations are given statutory force, however, there will be probably some difficulty in obtaining the necessary equipment to alter the present lighting arrangements in many factories. It would be better, they think, if compliance with the proposed regulations were not pressed in factories which are not engaged on work of primary importance, provided that the existing conditions are reasonably satisfactory. They add that in order to obtain the best results in lighting, alterations or new installations should be supervised by qualified illuminating engineers and that such experts over an appropriate age might well be included in the lists of persons in reserved occupations.

Annotations

DIPHTHERIA DIAGNOSIS BY POST

A CHILD died of diphtheria the other day largely because the result of a throat swab could not be reported earlier than three days after it was taken. The swab was taken and posted on Saturday, was received at the laboratory on Monday and a positive report was telephoned on Tuesday, by which time the child was so ill that it died later that day. Such happenings are not very rare, and every year the annual reports reveal that deaths from diphtheria occur mostly among patients in whom treatment with antitoxin has been too long delayed. The responsibility for these tragedies must be shared partly by the parent who does not call in the doctor when a child complains of sore throat, partly by the practitioner who does not notify or give antitoxin to the doubtful case, and partly by the local authority which does not—usually cannot afford to—supply its own bacteriological laboratory to which swabs can be sent by messenger. Parental care is an individual matter which we cannot greatly influence. In the absence of compulsory immunisation, what can the practitioner and the M.O.H. do to prevent deaths from diphtheria? The sage advice to the family doctor to give antitoxin to every case where the history or clinical condition indicates the need for a throat-swab carries more weight than ever in these days of delayed posts. It cannot be too often emphasised that the diagnosis of diphtheria is primarily clinical and "when in doubt, give antitoxin." At the best a bacteriological report cannot be obtained in less than 24 hours —48 hours if the swab has been sent by post—and with the Loeffler slope in some disrepute the bacteriologist may require 48 hours to report a result from the particular blood-tellurite method he uses.

The laboratory facilities for public-health bacteriology vary enormously in different parts of the country, and the whole system is in urgent need of revision and regionalisation. The emergency public-health laboratory service initiated by the Medical Research Council may, we hope, be the precursor of a regionalised service. London presents a special problem; some boroughs utilise the laboratories of voluntary hospitals, others the laboratory service of the London County Council, others again the Lister Institute, and still others private laboratories. Very few run their own laboratories for the simple reason that it would be uneconomical. Regionalisation is urgently needed, and the most rational scheme in metropolitan London would seem to be one in which the boroughs as public-health authorities joined hands with the L.C.C. as hospital authority. The L.C.C. has already an excellent system of group laboratories which would be readily accessible to the metropolitan boroughs for diagnostic work. The linking up of the two authorities by a joint laboratory service would doubtless lead to improvements in epidemiological and preventive medicine.

COMPETENCE OF VENOUS VALVES

THE original Trendelenburg test for the competence of the valves in the great saphenous vein has been so elaborated that its interpretation and its bearing on treatment have become obscured. McCallig and Heyerdale [1] have simplified the whole subject by pointing out that all the surgeon wants to know is whether the valves in the three systems of veins—superficial, deep and intercommunicating—are competent or not. They sweep away as confusing labels such terms as positive, negative, and double positive Trendelenburg, and rely on three very simple tests, one for each venous system. To demonstrate incompetency of the great saphenous vein they examine the patient standing. The fingers of one hand are placed at the saphenous opening; the fingers of the other hand percuss a dilated segment of the vein below. If an impulse can be detected by the upper fingers incompetent valves and a dilated main saphenous trunk can be strongly suspected. Proof is provided by reversing the procedure; a wave passing down the vein can only mean incompetent valves. Not all cases of dilated varices are associated with this incompetence in the main saphenous trunk, but the importance of the test is that with competent valves local injection of the varices stands a good chance of success. Tying the main vein is needed as a preliminary to injection when the valves in the saphenous trunk are incompetent. Without this preliminary ligature recanalisation is to be anticipated. The test for incompetency of the intercommunicating veins is equally simple. The patient lies down and his leg is elevated to allow the blood to drain away from the varicose veins. A tourniquet is placed high on the thigh, and the patient then stands up. If the varicosities fill rapidly within thirty seconds, it is assumed that there has been an overflow from the deep to the superficial circulation. In other words, the valves of the communicating veins are incompetent. This test has not much significance, because incompetence in the communicating veins is probably always associated with incompetence in the great saphenous veins, and efficient sclerosis in the main vein will in most cases counteract the effect of the back-flow through the communicating veins. In a few cases failure to occlude a localised segment may be explained by this back-flow, and carefully localised injection should be tried, and will probably be successful. The main contra-indication to sclerosing therapy is occlusion of the deep

3. Transactions of Illuminating Engineering Society (London), November, 1938.
4. Modern Factory Lighting, London, 1940, p. 17.

1. McCallig, J. J. and Heyerdale, W. W. *J. Amer. med. Ass.* July 13, 1940, p. 97.

venous system, for then the saphenous dilatation is compensatory. Persistent occlusion is comparatively rare. The presence of œdema and the previous history of the patient will suggest to the surgeon that the patency of the deep veins should be investigated. This is tested by occluding the superficial venous circulation by applying a gum-rubber bandage from the instep to just below the knee, or as high up the thigh as required. The bandage must, of course, not be tighter than is necessary to occlude the saphenous vein. If the limb is depending on the superficial venous circulation the constriction of the bandage will cause severe discomfort as soon as the patient tries to walk—so much so in fact that he will demand its removal. In such a case sclerosis of the saphenous system must not be carried out.

ACUTE ASEPTIC MENINGITIS

CASES have been noticed from time to time in past years in which there were symptoms and signs of meningitis but in which the cerebrospinal fluid proved sterile on culture and in which tubercle bacilli were not found. Most cases recovered undiagnosed. In 1934 Armstrong and Lillie[1] isolated a virus causing encephalitis and perivascular lymphocytic infiltration in monkeys and suggested that it should be called "the virus of lymphocytic choriomeningitis." The relation of this virus to infection in man was established by Rivers and Scott[2] in 1935. They isolated it from two cases of meningitis and subsequently it has been shown that about a third of cases of so-called acute aseptic meningitis appear to be caused by this virus. The latest case to be reported is described by Findlay, Stuart-Harris and MacCallum[3] in a British soldier on active service overseas. The soldier was under treatment with sulphapyridine for urethritis when he developed sudden headache with vomiting and signs of meningitis. The cerebrospinal fluid was faintly turbid and contained 500 leucocytes per c.mm., half of which were lymphocytes. Cultures were bacteriologically sterile. The fluid was injected intracerebrally into a guineapig and the virus of lymphocytic choriomeningitis was isolated. The patient recovered by the tenth day. This is the clinical story of most cases of this disease, but symptoms and signs vary considerably. The onset may be acute as in this case, but 12% of adult sera contain antibodies to the virus and therefore a number of symptomless infections must occur. Some cases present themselves as pyrexia of uncertain origin with no signs of meningitic involvement, the patient complaining of headache and recovering completely in 24–48 hours. In more severe cases meningitis develops but it is delayed for three or four days after the onset of pyrexia. In the case recorded by MacCallum and Findlay[4] the patient developed pain in the back and flaccid paralysis of both lower limbs and was diagnosed as suffering from poliomyelitis. In childhood the condition, like other infections, often begins with a convulsion. The development of a positive Kernig sign, or a bilateral extensor plantar response, is usually the indication for the examination of the cerebrospinal fluid, which shows an increase in cells and protein content without alteration in chloride—a valuable point in diagnosis from tuberculous meningitis in which the chlorides are low, often below 0·6 per 100 c.cm. The Lange curve is variable, meningitic and paretic curves having been described. There is usually a progressive improvement over a period of three weeks, but complete recovery is not necessarily the rule. The patient described by Barker and Ford[5] slowly developed a chronic arachnoiditis with spastic paralysis of the lower limbs.

1. Armstrong, C. and Lillie, R. D. *Publ. Hlth Rep., Wash.* 1934, **49**, 1019.
2. Rivers, T. M. and Scott, T. F. McN. *Science*, 1935, **81**, 439.
3. Findlay, G. M., Stuart-Harris, C. H. and MacCallum, F. O. *Jour. R. Army med. Cps*, July 1940, p. 8.
4. MacCallum and Findlay, *Lancet*, 1939, **i**, 1370.
5. Barker, L. F. and Ford, F. R. *J. Amer. med. Ass.* 1937, **109**, 785.

The mode of spread of the infection is not known; the virus is found in mice but the method of transmission from mice to man, if it does occur, has not been established. In 1939 MacCallum and Findlay recovered the virus from the nasopharynx of patients and it has been suggested that transmission is from man to man by droplet infection. This hypothesis is supported by the evidence in their latest case where no contact with mice could be established. It would have been useful to collect nasopharyngeal washings from patients in surrounding beds. The virus does not appear to be susceptible to sulphonamide preparations—in fact, in this case the condition actually developed while the soldier was under treatment with sulphapyridine. The virus is situated intracellularly, and, as in all virus diseases, antibody can have but little effect upon it.

FŒTAL HEART SOUNDS

NOT so long ago the heart patient could get away with only a venepuncture or possibly a straight radiogram, but today our South American colleagues think nothing of studying the anatomy of the heart and great vessels by passing a radio-opaque catheter through the veins of the arm into the right auricle and X raying the patient with the catheter in situ, and others are extending the domain of electrocardiography by using leads from almost every part of the body, including the œsophagus. Even the unborn child will soon be being investigated in a way which would have appalled our predecessors. The time-honoured obstetrical stethoscope is giving way to electrocardiograms of the fœtal heart, and in America they have been recording the fœtal heart-sounds amplified electrically. But though the practitioner may shy at such refinements investigations made with their aid may be of considerable theoretical and practical importance. Smith and Hervert[1] have used both electrocardiography and valve amplification to study the heart sounds in 58 fœtuses from 5½ months to the time of delivery, and they have come to conclusions which are at variance with much current teaching. In 47 of the 52 cases in which the sounds were successfully recorded there was no evidence of a tic-tac rhythm—the duration of ventricular systole ranged from 0·16 to 0·23 sec. and that of diastole from 0·17 to 0·53 sec. They found that the heart-rate may be very different in different fœtuses even when the child turns out to be healthy, their recorded rates ranging from 92 to 163 a minute. Their final important finding was that the first heart sound is seldom the accentuated one; indeed, it was accentuated in only 8 cases, while in 16 the intensity of the two sounds was equal and in 28 the second sound was the louder. They were fortunate enough to obtain a record of a systolic murmur in one of the fœtuses which was confirmed after birth—perhaps the first example of a congenital lesion of the heart being diagnosed in utero.

GENETICS AND THE SOCIAL WORKER

TALK to a layman for two minutes about genes and he says "And does that mean you can settle what kind of child is going to be born?" Tiresome as he is, he puts his finger on the spot; however objectively we try to approach the subject of heredity our scientific calm is disturbed by an itch to pull the strings ourselves: to find out how to breed a Shakespeare or a Lister, or at least how to avoid breeding mental defectives and thieves. Nowadays the science of genetics is beginning to give us data on which to draw a few tentative conclusions and even to take occasional action, but oddly enough students of social science have only the shadowiest notion of genetics, and students of biology are too much engrossed with their experimental insects and animals to attend closely to the persevering experiments in genetics which

1. Smith, A. L. and Hervert, W. J. *Amer. J. Obstet. Gynec.* July, 1940, p. 102.

are being carried out by the human race at large. L. L. Burlingame, of Stanford University, thinks it high time the two groups of students met, at least on the ground of a common course of study, and he has planned a series of lectures in which, starting from elementary genetics, he proceeds to problems of mental and physical inheritance in man, and studies of population growth, migration, race and war.

Lately his lectures have appeared as a stimulating book (Heredity and Social Problems. London and New York: McGraw Hill Publishing Co. Ltd., 23s.) in which, after a comprehensive but stringently compressed account of genetics, he reflects on the application of biology to human affairs. He is perhaps a trifle too cosmic. Man has progressed from cave to city, kingdoms have risen and fallen, civilisation has succeeded civilisation, for thousands of years the human race has struggled, suffered, experimented and progressed; yet Professor Burlingame in six pages is able to dispose of man's most baffling problems under four neat subheadings, as follows: nature and objectives of government; genetic adaptation; social adaptations; and genetic functions of government. But as Professor Lancelot Hogben has pointed out, in applied science there is a technique of asking questions as well as of answering them, and when Professor Burlingame asks himself the effects of differences of fertility on population groups of different levels of intelligence his technique, both as cantoris and decani, is excellent. He is able to show that intelligence tests provide a reasonable instrument of measurement; that what they measure is something of practical importance; that differences in that something are largely determined by organic inheritance; that many factors play a part in that inheritance; and that the higher on the scale a person is placed the fewer, on the average, are his children. Figures showing the size of these effects are an important contribution to social science which can only be ignored to the detriment of mankind. The scientific problem may have been attacked for a purely practical reason, but it has been investigated within the bounds of science. The intelligence test is a standard of measurement—not a completely accurate or universal one, but one which is serviceable in practice. The sociologist who uses it has to learn what the test measures and what it does not; he is then in a position to draw reliable deductions and to apply them.

But Professor Burlingame is in a much weaker position when he asks himself "What is the value genetically of the various types of government?" He steps at once out of the realm of the measurable, because the variable factors are too numerous and many are obscure. There is such a thing, moreover, as social inheritance. Peoples are more than the sum of their genes and a generation passes on to its successor not merely its chromosomes but its traditions.

ECONOMY IN THE INSULIN TREATMENT OF SCHIZOPHRENIA

THE efficacy of the treatment of schizophrenia with insulin has not yet been proved beyond doubt, but its results have been encouraging enough to warrant its continuance at least until something better turns up. In these hard times the method has the objection of being extravagant in insulin, and, less seriously, in the sugar required to end the hypoglycæmia. Russell Fraser, cited by Maxwell Jones on another page, has found that for this purpose sugar can largely be replaced by starch. McGregor and Sandison[1] bring their patients round by giving them 7 grammes of glucose intravenously, followed by a pint of soup containing 12 oz. of potatoes when they have recovered. Patients are said to prefer this soup to the usual sweet drinks and keep it down better, and it works equally well. Like Maxwell Jones they have tried injecting the insulin intravenously instead of intramuscularly, and have found in eight patients that the dose required to produce coma was on the average 47% less. On the other hand Maxwell Jones found in seven patients that the intravenous coma dose was the same as the intramuscular, though coma was produced more rapidly with the intravenous route. The reason for this divergence of experience is not clear. Apart from the question of route, which needs further inquiry, the possibility of reducing insulin consumption by Braunmühl's[2] method of zigzagging the dosage deserves consideration. This has hitherto been used principally for breaking down high resistance to insulin, but it might well reduce the coma dose of less resistant cases.

1. McGregor, J. S. and Sandison, R. A. *Brit. med. J.* Sept. 7, 1940, p. 310.

CONTUSION OF THE LUNG

EVERY new ordeal to which the lung of man is exposed produces if not an entirely new lesion at least a new angle from which to study an old one. Dust causes a fibrosis, irritant gases an acute tracheo-bronchitis, and now the blast of high explosives is giving us a special type of "pneumonia." Osborn[3] describes five cases of pneumonia affecting the phrenico-costal sinus area of the lung which throw some light on the mechanism of blast bruising. Two of his patients had fallen on their side, two had been delirious, and the other had been killed by a bomb. In all five there was a hæmorrhagic lesion at the extreme base of the lung, as a rule wedge-shaped and sharply defined, resembling that produced elsewhere by a pulmonary infarct. Osborn suggests that the movements of the diaphragm are important in the causation of this lesion. "In expiration," he writes, "the lateral muscular fibres of the diaphragm lie against the chest wall and obliterate the sinus, leaving it a potential space only. Inspiration involves active contraction of the diaphragm, which therefore descends and opens the phrenico-costal sinus, the outer parts of the base of the lung being drawn into the sinus." If the breath is held with the lung in this position, as it often is during muscular effort, a fall on the side may nip the lower part of the lung between the elbow without and the liver or spleen within, and moreover the diaphragm and other respiratory muscles will be relaxed for the beginning of expiration and will give the lung no protection. Osborn suggests that these two forces, external and internal, also operate in the bruising of the lung lately described by Zuckerman and by Dean and his colleagues.[4] According to Zuckerman blast has two components, a momentary wave of high pressure being followed by suction, and he mentions three possible explanations of its effects on the lung—first, a lowering of alveolar pressure, acting through the respiratory passages, with consequent rupture of the alveolar capillaries; second, distension of the lungs with air; and third, impact of the pressure wave on the chest wall. In his experiments on animals he found the outstanding lesion to be a hæmorrhage in the lungs, more particularly in the line of the ribs, varying in degree according to the distance of the animals from the high explosive, and unaccompanied by any fractures or external sign of injury. Animals whose bodies were clothed in thick layers of rubber suffered little or no damage compared with controls, a point which has a bearing on prevention by wearing sponge rubber around the chest. Similar hæmorrhages are often found in small healthy laboratory animals killed by chloroform or by sudden fracture dislocation of the axis vertebra. Here again there is a

2. Braunmühl, A. von. Die Insulinshockbehandlung der Schizophrenie, Berlin, 1938; see Tillim, S. J. *Amer. J. Psychiat.* 1939, 96, 361.
3. Osborn, G. R. *Brit. med. J.* Sept. 7, 1940, p. 317.
4. Zuckerman, S. *Lancet*, Aug. 24, 1940, p. 219; Dean, D. M., Thomas, A. R. and Alison, R. S. *Ibid*, p. 225.

traumatic factor in the convulsive movements of the thoracic and abdominal muscles during the last few moments of life, which may act as Osborn suggests. The lung lesion is probably produced by a rupture of the capillaries derived from the pulmonary artery which lie relatively unprotected in the walls of the alveoli. The primary part of the lesion therefore is blood in the alveoli, but secondary results soon follow. If this explanation of the various phenomena recorded by different observers is accepted, and it seems the obvious explanation, a new name must be found for the clinical condition produced. The lesion is not primarily an inflammation, though many of the clinical and radiological signs described by Dean and others are similar to those of pneumonia. Obviously the condition is not a new one; trauma is as old as man, and as long ago as 1881 Litten spoke of contusional pneumonia. What is new is a highly dangerous cause—the high-explosive bomb.

MORE LIGHT ON MARIHUANA

THE unending ingenuity of man in devising the means of escape from reality has created a new science which has ramifications into many subjects including sociology, psychiatry, pharmacology and chemistry. Even the etymologist must pay tribute to the resourcefulness of the drug-addict, and only the reader imbued with the spirit of The Golden Bough could hope to grapple with such words as charas, bhang, ganja, marihuana and hashish, all of which are used to designate various preparations of the hemp plant. We have previously reviewed the comprehensive monograph on marihuana by Walton [1] who raised serious doubts about the habit-forming nature of this drug. If his scepticism is substantiated—and Bromberg's psychiatric study [2] goes a long way to bear out his views—we may find ourselves in the position of having demonstrated that there is a substance that possesses all the virtues of the forbidden fruit and none of its calamitous after-effects. The prospect compels the closest examination, and justifies the renewed attempts that are now proceeding to throw light on the chemistry of its active principles. Adams [3] recalls that in 1896 Wood, Spivey and Easterfield extracted hemp with petroleum ether and distilled from the extract a high-boiling fraction which apparently contained most of the active principle. This fluid, which they called "red oil," was investigated again in 1932 by Cahn, who extracted from it a potent substance and indicated its chemical structure. Workers under Adams's direction in the University of Illinois have now put the finishing touches to Cahn's work by revising the formula, and have finally clinched the matter by "an unequivocal method of synthesis": cannabinol is now stated to be 1-methyl-3-*n*-amyl-6,6,9-trimethyl-6-dibenzopyran. By a new method of procedure they have also isolated another pure compound, cannabidiol, the exact chemical structure of which has not been finally settled. As might be expected, isomerisation raises possibilities which are full of interest to the chemist. Thus, cannabidiol might isomerise readily in the plant to a tetrahydrocannabinol which upon oxidation would be converted to cannabinol. "Such a series of reactions," says Adams, "has been consummated in the laboratory." Another remarkable finding is that the tetrahydrocannabinol may be obtained in two forms according to the physical conditions which accompany the reaction, and one of these has a very high marihuana activity, many times greater than that of purified "red oil." While Adams and his colleagues are busy with homologues and analogues of tetrahydrocannabinols, he records that Todd has isolated from red oil a substance which he calls cannibol, and that Haagen-Smit has discovered in this oil a crystalline compound which has physiological activity. If the chemists have not yet plumbed the depths of analytical possibilities in the red oil of marihuana, pharmacologists have scarcely begun their researches on the active principles already isolated. The prospects are exciting enough, for they include an opportunity to correlate the chemical structure of these substances with their curious psychological effects in the human subject.

1. See *Lancet*, 1939, **2**, 567.
2. Bromberg, W. *J. Amer. med. Ass.* 1939, **113**, 4.
3. Adams, R. *Science*, Aug. 9, 1940, p. 115.

MIDWIVES IN EMERGENCY

THE report of the Central Midwives Board for the year ended March 31 deals with the effect of the war on its work and the changes necessary to meet the new conditions. The outbreak of war in no way lessened the country's need for a midwifery service of the highest efficiency and the board aptly recalls the impetus given by the last war to the maternity and child-welfare movement. The board is determined that hard-won standards shall not be lightly abandoned and it solicits the coöperation of supervising authorities and medical officers of health in avoiding any slipping back. The demand for practising midwives has increased as a result of the war. Many doctors have given up their maternity work for war service and some midwives have also been called up. To ensure against undue depletion the Ministry of Health issued last August an instruction that no midwife, whether she is a trained nurse or not, should be diverted to casualty or other work until the full requirements of an emergency midwifery service have been met. And in general this instruction has been observed. Things were made easier by a regulation permitting any woman who had surrendered her certificate under section 5 of the Midwives Act, 1936, to resume practice for a period, and up to the end of March 126 retired women had returned to their old work. Last year it was decided to draw up a register of women willing in a national emergency to do midwifery either near home or at a distance; 1500 midwives were prepared to assist in their home districts. We do not know how many of these were utilised but most of the volunteers who offered to serve anywhere were allocated to the improvised maternity homes in reception areas. For those who had not practised for some time the Midwives Institute arranged refresher courses. Last September midwives escorted expectant mothers to safe places and 100 of these midwives remained for work in the reception areas. Another 250 midwives were sent by the board and 60–70 pupil-midwives were transferred with their teachers. The board notes with appreciation how ready midwives were to go anywhere at very short notice and in spite of trying conditions surprisingly few complaints were heard. Now a number of these improvised homes have been closed and almost all the L.C.C. midwives have returned to work in London. Other improvised homes remain open with a skeleton staff or are being kept on a care and maintenance basis. On one other matter the board took immediate action. In some parts of the country instruction in midwifery was being given to A.R.P. workers, but the board took the view that a woman whose labour comes on in an air-raid shelter should be regarded as a civilian casualty and conveyed to a hospital or first-aid post where a doctor is in attendance, if there is no time or opportunity for a doctor or midwife to be summoned. The Minister of Health concurred and steps were taken to put an end to that kind of instruction.

THE Istituto de Tisiología, of the Montevideo faculty of medicine, has begun to publish a new journal called *Archivos de Tisiología y Pneumología*. The first number (176 pages) consists of three articles: Dr. Juan Morelli presents a study of the pathology of the lungs from the embryological point of view; and Dr. Pedro Cantonnet and Dr. Juan Etcheverry contribute two articles on B.C.G. vaccine. There is no indication on the journal of how often it will appear or of its price. The editors should be addressed at the institute, Hospital Fermin Ferreira, Montevideo.

Special Articles

THE LABYRINTH

By MAXWELL ELLIS, M.D., M.S. Lond., F.R.C.S.
ASSISTANT SURGEON TO GOLDEN SQUARE THROAT HOSPITAL, LONDON

A FRESH impetus may be given to research work on labyrinthine function by the comprehensive testing of the organ during the physical examination of would-be pilots; the mass of statistical information now being collected should add considerably to our knowledge. The precise function of the labyrinth is yet unknown, owing to its anatomical position in one of the densest and most inaccessible bones of the body, but it is of the greatest importance to the animal because it enables him to maintain equilibrium while at rest or in motion. Important and classical contributions to the solution of the problem were made by Ewald in 1892 and Bárány in 1907, and their monographs illustrate the technical difficulties of research in this field. They relied chiefly on extirpation experiments in animals, although Bárány also made numerous clinical observations. A further advance was recorded in 1924 by Magnus, who reviewed the problem of posture at rest and in motion as a whole. Using animals decerebrated in different planes through the mid-brain, he concluded that the general static reactions affecting the body could be analysed into tonic neck reflexes, tonic labyrinthine reflexes and attitudinal reflexes. The attitude assumed by an animal is the algebraic sum of reflexes from the proprioceptive nerve-endings in the neck muscles and reflexes from the labyrinth. He also assigned functions to various parts of the labyrinth, but much of this work has subsequently been contradicted. The chief value of his contributions was to clarify ideas and reopen the problem to more advanced methods of investigation.

THE SEMICIRCULAR CANALS

Tait and McNally (1925) carried out experiments on frogs. They perfected a technique whereby the nerve branches to each individual canal and to the utricle and saccule could be divided without injury to other branches. The reactions of the frogs were then carefully studied and analysed on a turn-table and a tilt-table. They called the local mechanism of stimulation "propriation," and the effects on the body as a whole the "servation." The principle had previously been established that the propriation of the semicircular canals depends on angular acceleration which throws the endolymph of a canal to or from the ampullary end where it stimulates the crista. They found that when the movement occurs round an axis at right angles to the plane of the canal the effect on the endolymph is maximal; but it was also established that rotation, even about an axis in its own plane, can stimulate the canal. The fluid in this case has no circumferential flow but probably moves in vortices—anyhow, sufficient commotion is produced to affect the crista. The threshold of excitability increases as the plane in which the rotation is occurring approaches normality to the plane of the canal. They confirmed Ewald's finding that the horizontal canal is stimulated by an ampullipetal flow of endolymph and the vertical canals by an ampullifugal movement of the fluid, but differed from him in believing that the canals possess only one-sense receptivity.

Concurrently, Steinhausen (1932) had been investigating the reactions of the horizontal canal in the living pike. He injected Indian ink into the endolymph and showed that the cupula (a mucus-like material in which lie the hairs of the crista) stretches from the floor to the roof of the ampulla, and completely separates the endolymph of the canal from that of the utricle. He then demonstrated that although the cupula can bend either way it only acts as an effective stimulus to the cristal nerve-endings in one direction—when deflected towards the utricle by an ampullipetal flow of endolymph. He also showed that the cupula bends during movements of angular acceleration or deceleration, and that during angular rotation at a constant velocity it returns to its resting position by its own elasticity. Thus it moves in one direction during acceleration, gradually returns to its original position when the rotation attains an even velocity (provided this lasts from 20 to 40 seconds), and is then deflected in the opposite direction during deceleration. He measured activity by observing the reflex eye movements and attributed the opposite sense of the after-nystagmus to the intact horizontal canal of the other side.

Ross (1936) was able to record action currents from single fibres of the nerve supplying the crista and found that bursts of activity occurred in the nerve as a result of rotation in a manner confirming Steinhausen's findings. However, this work has been queried by Lowenstein and Sand (1936; Sand 1940), who used a similar method. They began with rather more fundamental observations and showed that the hair cells of the acustico-lateral sense organ in fishes (which is morphologically identical with the labyrinth) have a spontaneous activity and discharge a persistent rhythm of impulses of low frequency. They also demonstrated that perfusion of a length of the lateral-line canal in one direction increases the frequency of this discharge and in the other decreases it; these particular cells, then, are endowed with two-sense receptivity. Analogous stimulation of the hair cells of the semicircular canals is achieved by rotation, and these workers went on to show that the canals are in a state of continuous excitation, and that rotation in one sense increases this activity and in the other diminishes it. Their records indicate that deformation of the cupula results in an alteration of the frequency of the action potentials of the nerve, and that this returns to the normal resting rate at a time corresponding to the recovery of position of the cupula by its own elasticity. Steinhausen's work on this point is thus confirmed although his other findings are contradicted. At this point may be considered the interesting fact that after unilateral labyrinthectomy in animals and man rotation in either direction is accompanied by reflex eye responses, and this is easier to understand if two-sense receptivity exists in the canal end-organs. Ewald's original contention seems to have been justified.

UTRICLE AND SACCULE

The utricle is a receptor of gravity and linear acceleration, responding to displacements of the otoconia on the surface of the macula. This much of its propriation has been elucidated in a manner similar to that of the canals. Ross was unable to find any spontaneous activity in the utricular receptor while the animal is at rest. Tait and McNally found that a frog left with only its utricles responds to slow tilt by intermittent adjustments and to rapid tilt by an unphysiological acceleration of movement in the direction of displacement. They thought this was due to the otoconia, because of fluid friction, being thrown away from the direction of the tilt when this occurs rapidly, whereas, during slow tilt, they merely remain stationary floating in the supporting mucus while the substratum moves until such time as this change of relationship evokes a correcting stimulus. Ross could not corroborate this; the electrical discharge showed no discontinuities during a slow tilt, and he could find no nerve-fibres which responded to a quick tilt in a way similar to that in which fibres respond to a slow tilt in the opposite direction. Much therefore yet remains to be discovered of utricular propriation. Tait and McNally and others have shown that the saccule is a receptor of vibrations of low frequency, and it apparently has nothing to do with equilibrium.

SERVATION

The results of research on the servation of the canals and utricles is to some extent contradictory. First of all, canalicular stimulation produces reactions in consciousness; this has been demonstrated in blindfolded human subjects submitted to rotation, and in guineapigs; unilaterally labyrinthectomised guineapigs are not disturbed while feeding if rotated to the operated side, but immediately cease when this rotation is reversed.

Secondly, skeletal muscle tone is under some form of labyrinthine control. Ewald demonstrated that bilateral

labyrinthectomy produces a degree of flaccidity, and it was shown by Tait and McNally that this is due to the removal of canalicular influence. In addition, Lowenstein and Sand's discovery that the canal end-organs discharge continuously indicates that they are in constant activity, possibly for this control of muscle tone. The canals react to the onset of angular acceleration by causing stiffening of the appropriate muscles to withstand the head displacement, thus resisting the evoking forces. This action is similar to a tendon-jerk which is designed to resist the force of sudden extension which produces it. Both canal and tendon reflexes control the compactness of the body in an emergency, for instance, in a sudden fall. An animal deprived of the former falls "in a heap" even if its tendon reflexes are intact, showing that the canals are the more important controlling mechanism.

Thirdly, the ocular muscles are reflexly affected. The ocular reactions are twofold—nystagmus and compensatory or counter-rolling movements. Nystagmus is always in a plane parallel to that in which the rotation occurs, and consists of two components, a slow and a quick. The slow component is a drift of the eyes in a direction opposite to that of rotation. If the subject is turned to the right, outside objects appear to be going to the left. The swing of the eyes to the left is an attempt to keep the outside world in focus. The quick component is a rapid flick movement in the opposite direction, and is probably a reaction from the cerebral cortex. Arellano (1938) has interpreted these movements by an interesting analogy with the technique of cinema projection. He likens the slow component of the movement to the successive pictures which, while they remain stationary, are illuminated. Its purpose is to hold the existing panorama steady despite head movements. The rapid component corresponds to the phase of darkness between the successive pictures during which visuo-cortical registration does not occur. Thus nystagmus is really a device to secure better vision during a time when the foundations of support of the animal are unstable. This effector apparatus is not limited to the ocular muscles; in some birds the neck muscles also take part. Compensatory movements consist of the slow component only of nystagmus and are best demonstrated during very slow tilt, although they also occur with rotation. They attempt to fix the visual axes during mild or leisurely deviation of the head, and occur in the same plane as this deviation.

Fourthly, the labyrinth exercises a considerable influence on the body musculature apart from the control of tone, although attempts to analyse the reactions of the muscles with respect to the individual components of the labyrinth have led to confused results. The general pattern is clear and was well described by Magnus. Tait and McNally patiently investigated the servation of each canal by their method, and their findings were amplified by Lowenstein and Sand, who recorded the action potentials of the nerves during rotation in different axes. The horizontal canals control the posture of the homolateral side of the body; stimulation of one canal bends the trunk to the opposite side in a lateral curve. They also control linear progression because if the trunk is curved laterally only circling movements can be achieved. Tait and McNally showed that each of the vertical canals protects the homolateral quadrant of the body against downward canting movements—the anterior canals control the upper limbs and the posterior the lower limbs. It was at first considered that the anterior vertical canal and the contralateral posterior vertical canal are synergic, but Lowenstein and Sand have shown that the vertical canals, while reacting to rotation in all three planes of reference, coöperate in two antagonistic pairs, one pair being excited when the other is inhibited. But the pairs differ for each axis of rotation. Certainly during rotation about a vertical axis they are diagonally synergic, but during rotation about a longitudinal axis they are laterally synergic and about a transverse axis they are transversely synergic.

Tait and McNally consider that the vertical canals and utricles act in coöperation. The utricles are in very precarious equilibrium and the slightest head movement produces a movement of the otoconia which in turn causes a head movement in compensation. This then stimulates the other utricle and a further head movement in the same direction as the original one results, and so on. This "pendulation" from uncontrolled utricular action is cut short by the more precisely reacting vertical canals. However, if the head displacement is sufficiently slow, utricular reaction is less energetic and equilibrium is maintained. This mechanism controls posture during linear progression. It thus appears that utricular stimulation depends on simple change of direction between the level on which the animal rests and the field of gravity force, whereas the canals are excited only by rotational displacement. Thus although the ultimate postural effects determined by the utricles and the vertical canals are interchangeable they are achieved by different methods of stimulation.

The conception that the labyrinth has two distinct physiological actions, kinetic in response to head movement and static in response to a particular fixed orientation of the head, must be modified. All labyrinthine reactions result from movements, and not only is movement necessary for the stimulation of the receptors but also the reaction consists of an alteration of existing bodily posture by the production of body movements.

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MEDICINE AND THE LAW

Incurable Insanity but no Divorce

Two recent decisions of the President in the Divorce Court seem to indicate an unhappy lacuna in the law of divorce for insanity. Under the "Herbert" Act a petitioner is entitled to divorce if the other spouse is incurably of unsound mind and has been continuously under care and treatment for the previous five years. "Care and treatment," we know from the decision in Shipman *v.* Shipman last year, are words to be construed strictly. In Murray *v.* Murray the wife was detained in Bexley mental hospital under a reception order dated Aug. 15, 1923, suffering from secondary dementia with no prospect of cure. In 1935 she was discharged to a poor-law institution at Leavesden, not because she was recovered but in the course of the procedure under section 25 of the Lunacy Act. This procedure allows a pauper lunatic, nowadays called a rate-aided patient of unsound mind, to be discharged (although not yet recovered) on the certificate of the medical officer of the asylum and to be received and detained in a workhouse without further order if the medical officer of the workhouse certifies either that there is satisfactory separate accommodation for the patient or that the patient's condition is such that for the convenience of the patient or the other inmates of the workhouse separate accommodation is unnecessary. The difficulty in Murray *v.* Murray was that only the first of the two certificates prescribed by section 25 had been given—namely, the certificate for the discharge from Bexley. The medical officer of the workhouse had not given the other certificate about the accommodation at Leavesden. The result was that Sir Boyd Merriman found himself obliged to hold that, though the wife had been legally discharged from Bexley (and the original reception order thereby terminated), she had not been legally detained at Leavesden. The discharge brought the reception order to an end, and there was no further provision for continuing the patient's detention. Hence, legally speaking, there was no continuous "care and treatment" for the purpose of the five-year period for the obtaining of a divorce. The court thus followed its previous decision in Hall *v.* Hall, where the same institution was concerned as in Murray *v.* Murray.

This means, as is pointed out in the *Solicitors' Journal* of Sept. 7, that poor persons whose incurable insane spouses have been detained for five years and more in accordance with reception orders under section 25 of the Lunacy Act may find themselves deprived of any chance

of divorce because of the decision of visitors or medical officers of mental hospitals who had not present to their minds the prospective interests of husbands or wives in divorce under the Herbert Act. The first condition for discharge under section 25 is a decision by the visitors or medical officer under section 77, which enacts that any three visitors (or any two visitors if the medical officer so advises in writing) may order the discharge of a person detained. Apparently it will not help the petitioners in these cases if a retrospective certificate is now given by the medical officer of the receiving poor-law institution. The original reception for Bexley was cancelled by the order for discharge from Bexley. From that moment, unless the certificate of the medical officer at Leavesden was at once forthcoming, the lawful detention ended. Consequently the five-year period for the purposes of the Herbert Act (a period continuing up to the date of the petition) cannot be established. Assuming that these decisions in the Hall and Murray cases are correct, there seems no remedy for the petitioners except a private Act of Parliament, unless some remission of the preoccupations of Parliament presently permit a legislative review of the Herbert Act of 1937.

Public Health

Care of Defectives in Birmingham

A REPORT to Birmingham education committee by Mr. P. D. Innes, chief education officer, on the special schools aftercare subcommittee reveals the influence of war conditions on that backwater of school medicine which suffers most when the waters run low. The special services for the blind, the deaf and the crippled are so firmly established and of such obvious utility that even war will not interfere with them, but it is otherwise with the care of the mentally defective. Local authorities are seldom eager to discharge their statutory obligation to make provision for the detection, education and management of the feeble-minded and in times of stress the central authority is not over-eager to coerce them, for the Day report suggested, almost in so many words, that the detection of mentally defectives should be governed by the accommodation for them already existing—if any! Had it not been for the keenness of voluntary societies and helpers the care of the feeble-minded would be much poorer than it is, though the records of Birmingham aftercare committee show results which are far from discouraging. Of 7800 cases on the visiting list, 2816 are in remunerative work; 696 are usefully employed at home; 86 are serving in the forces; 111 have been allowed to lapse, and 194 have been transferred to normal schools. Of the remainder, 1217 have been lost sight of; 457 are dead; 1189 are in institutions; 965 were excluded from school as being incapable of education; and 69 were transferred to other special schools.

From the Annual Reports

The first to be received of the annual reports of the medical officers of health for 1939 was that of Dr. A. Massey of *Coventry*. This, in accordance with Circular 2067 of the Ministry of Health, is a typewritten interim report of five pages only. In mid-1938 the population of Coventry was 219,900; in mid-1939 it was estimated at 234,000 and in July, 1940, at 250,000. Though the population of Coventry has been growing rapidly for some years, its increase since the outbreak of war is abnormally heavy as a result of its war industries. This increase would bias the age-sex distribution and so upset the vital statistics. To compute standardised, or even comparable, rates would, in the circumstances, be lengthy and troublesome, so Dr. Massey gives only crude rates. The infantile mortality-rate, which is self-standardised, was 54·6 against 56·0 in 1938. Coventry can claim better rates than these in recent years, its record being 46·5 in 1935. The crude birth-rate was 17·7 against 16·5 in 1938 and the crude death-rate 9·3 against 9·4. The brisk rise in the birth-rate is noteworthy. The cancer rate fell from 1·17 to 1·09, but this may be due to the loading of the population with young adults. The 1939 returns of the venereal-diseases treatment centre show no local increase of venereal infections.

The report of Dr. Hugh Paul of *Smethwick* is printed; it obeys Circular 2067 in being drastically curtailed, but whether it agrees with the intention of the circular is doubtful. As Dr. Paul's report is exceptionally interesting and the meaning of Circular 2067 is exceptionally obscure we have a fine opening for finding out what the Minister of Health wants us to give him; for it is hard to say whether the report contains matter desired to be given or to be deleted. Dr. Paul's report is devoid of all statistical tables; it is a commentary on the health of Smethwick during 1939 with special emphasis on the influence which war and the preparation for war had on the health services of the borough and on the incidence of disease in the population, with only so much statistical matter as is necessary to support the argument. This might be what Circular 2067 seeks had it repealed Circular 1961, but since the latter still stands we must presume that the "further curtailment" required by 2067 must be consonant with the minimum requirements of 1961. If this is so, Dr. Paul's report is not what the Minister wants. Yet it is what we want, for it is an account of the difficulties created by the war and what an experienced hygienist did to overcome them. The war itself had no detectable influence on the health of Smethwick in 1939, which was a healthy year without any event of outstanding public-health importance. But the preparation for war had a great influence on the work of the public-health service and added risks of a breakdown in those services had the war in 1939 produced, or should it later produce, the public-health problems which were expected. Dr. Paul says that throughout 1939 he had to devote 50–75% of his time to A.R.P. and so much of the ordinary activities of public health had to be more or less neglected. This means that in order to be prepared for civil casualties he had to risk being unprepared to deal with the epidemic situations and special difficulties of maternity and child welfare which were certain to occur in the course of the war. Luck was with him, as it was with all of us, in that the casualties did not occur, epidemic situations did not arise, and the general health services, as a result of years of hard and enlightened labour, were in a position to deal with such added strains as the war produced during its first phase. The war did nothing that it was expected to do; there was no increase in venereal disease, and infectious diseases were lower in incidence than would be expected in a peaceful year. Yet the future must be viewed with apprehension, for at the time of writing his report for 1939 Dr. Paul saw, as we all must see, that what we expected the war to do was only delayed and that the health histories of 1940 and onwards will be very different from that of 1939.

INFECTIOUS DISEASE IN ENGLAND AND WALES

DURING THE WEEK ENDED AUG. 31, 1940

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1194; whooping-cough, 970; diphtheria, 908; enteric fever, 122; measles (excluding rubella), 5912; pneumonia (primary or influenzal), 312; puerperal pyrexia, 128; cerebrospinal fever, 111; poliomyelitis, 31; polio-encephalitis, 4; encephalitis lethargica, 2; dysentery, 66; ophthalmia neonatorum, 85. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Aug. 30 was 829, made up of: scarlet fever, 145; diphtheria, 186; measles, 100; whooping-cough, 29; enteritis, 51; chicken-pox, 31; erysipelas, 28; mumps, 8; poliomyelitis, 1; dysentery, 6; cerebrospinal fever, 24; puerperal sepsis, 25; enteric fevers, 38; german measles, 1; other diseases (non-infectious), 78; not yet diagnosed, 78.

Deaths.—In 126 great towns, including London, there was no death from smallpox, 1 (0) from scarlet fever, 1 (0) from enteric fever, 7 (0) from whooping-cough, 8 (0) from measles, 20 (0) from diphtheria, 27 (0) from diarrhœa and enteritis under 2 years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever was at Northampton. Deaths from diphtheria were scattered over 17 great towns, Plymouth reporting 4. There were 11 deaths from diarrhœa at Liverpool.

The number of stillbirths notified during the week was 200 (corresponding to a rate of 39 per thousand total births), including 24 in London.

Letters to the Editor

NEUROTICS IN THE FORCES

SIR,—Your leading article of Sept. 7 contains matter for serious consideration and gives some timely, sane and salutary advice. All neurotic behaviour is really the result of organismal failure, but such behaviour may only be considered abnormal or morbid if it results from strains or stresses which would not break the average individual. The psychogenic origin of the neurosis implies belief in the obsolete dualism of the Dark Ages—a doctrine which should not now be considered reasonable. In the last war many cases of war neurosis were returned to the firing line, but on the whole it was not a good thing to do. Some soldiers who were made of good stuff and who were broken only by severe strain could, after rest, return to useful, regular and efficient duty; but the majority of "returns" had to be very carefully watched, guarded and supported in order to keep going. It was the general experience of regimental medical officers that soldiers who had broken down in the firing line should not be returned to it, and this would support your contention that the habit of sending neurosed men back to the battle zone is of doubtful value.

One other matter. It is noted that in the E.M.S. scheme for the treatment of war neurosis the personnel appears to consist largely of psychiatrists, some psycho-analysts, and a few physicians. This is a bad scheme and can never work well. The personnel should consist largely of physicians whose daily work includes the treatment of many neurotics. To this main body of physicians should be added psychiatrists to deal with alienated cases, and some psycho-analysts to deal with the very few cases who might benefit from this type of treatment—a type of treatment which is rather a needless luxury in the present emergency.

Aberdeen. A. W. HENDRY.

SIR,—In spite of Mr. J. B. Priestley's counsel to us on Sunday evening "to avoid controversy and, in these days of danger, to make allowance for the astonishing queerness of other folks," I must call in question the loose logic, the ill-founded generalisations and the crude conclusion of your leader on neurotics in the forces. It contends that all neurotics, being constitutionally weaklings and capable only of rather a feeble adaptation, are of no use in the army and should be excluded. Medical recruitment boards should therefore be instructed to turn down all men with a history of nervous instability confirmed by their doctor, and psychiatrists should investigate doubtful cases. This drastic over-correction of the present difficulty would no doubt exclude the mentally unfit, but it would also debar from service many potentially brilliant soldiers and possible heroes. Not all, only some, neurotics are constitutional weaklings, bound to break down in moments of stress and danger; the main disability of such persons is a dull and backward intelligence, camouflaged by superficial hysterical phenomena. Even without their neurotic symptoms they would be no use to the Army.

The intelligent neurotic is a different person. The wayward passionate youth, unable to impose on himself the discipline of mind necessary for peace-time adjustment, may in the Army turn into a doughty fighter. The man whose anxiety state in civil life depends largely on family and financial problems may in the less demanding environment of the Army grow fat in his body and easy in his mind. And another type, a martyr in peace-time to inner doubts and fears, may actually welcome the experience of external danger and excitement, and take comfort from the sight of "normal" men being afraid of dangers which seem insignificant to him. Many of these will serve the Army well, especially if they have had some psychological treatment, and among them no test except that of army life itself will separate those who will break down from those who will adapt themselves. Yet a recruiting board instructed by your leader writer would exclude them all, and would probably exclude with them others whose "instability" is no more than the combination of imagination with intelligence. That combination, admittedly, may be the groundwork of fear, even of neurosis, but without it no modern fighting force can be effective.

I wonder whether others besides myself were left with the impression that the writer of your leader would admire some of the sentiments held by our enemies. They too are rather contemptuous of the weak, glorify insensitiveness to the horrors and suffering of war, and recognise "the importance of constitution" in their theories of racial-purity.

D. R. MACCALMAN.

Department of Psychological Medicine, Aberdeen.

CHEMOTHERAPY AND CONVALESCENT SERUM IN POLIOMYELITIS

SIR,—During the recent outbreak of poliomyelitis in the vicinity (now apparently over), one of us (S. M.) has had an opportunity of seeing in consultation a number of cases of the disease. In some of these the development of paralysis was so rapid that death occurred within two to three days of the onset of the severe symptoms, even with the free use of the "iron lung" and other appropriate treatment. We have lately prepared a generous supply of potent poliomyelitis serum from patients in the fourth to sixth week of convalescence, and have been using this in combination with soluble M. & B. 693 as a routine. Success has already been obtained in a short series of desperately ill cases and the results in milder cases also are most reassuring. In no case has there been any serious reaction either to the serum or the M. & B. 693.

In adults we give 20 c.cm. of convalescent poliomyelitis serum intramuscularly and 2 g. of soluble M. & B. 693 in 40 c.cm. normal saline intravenously at the earliest moment possible. The same dose of soluble M. & B. 693 is repeated every four hours until 8 g. has been given. A second dose of 20 c.cm. poliomyelitis serum is given 8–10 hours after the first. Next day the same quantities of serum and M. & B. 693 are repeated, and in the more severe cases half these quantities are also given on the third day of treatment. Complete rest is ensured and paralysed limbs are splinted without delay. Fluids are given freely and alkalis as required. In children and adolescents the procedure is modified according to age. Since the present procedure has been adopted, we have had no deaths and no serious extension of paralysis in any case once treatment had a chance of becoming effective. The following are notes from a few cases of the severe type.

CASE 1.—Male aged 17 years; well developed; good athlete; fit and well until 5 days previously; illness started with headache, slight fever (99° F.) and pains across shoulder girdle. Previous history of rheumatic fever; the present illness was thought at first to be another attack. On the second and third days the temperature was higher, ranging up to 103° F.; pains more severe in back; on fourth day slight paresis of one arm noticed. Seen in consultation by S. M. on fifth day. Temperature 103° F.; complete paralysis of left arm with marked paresis of right arm. Weakness of both lower limbs; diaphragm paralysed; breathing distressed. Patient removed to hospital within two hours of consultation, but by then condition had advanced considerably; breathing was difficult and patient began to show confusion. Treatment commenced immediately on arrival at hospital—serum, soluble M. & B. 693—and patient was placed in iron lung. Further serum and soluble M. & B. 693 given during the day. Next day swallowing was impossible and patient was semi-comatose; he was given a drip glucose-saline transfusion while in the iron lung. Serum and soluble M. & B. 693 continued. On the eighth day the patient's condition had improved immensely; fully conscious again; able to converse and swallow. Afterwards he made steady progress; now out of the iron lung entirely; is completely afebrile; residual paralysis of left arm with partial paralysis of right.

CASE 2.—Male aged 18 years; well developed; no previous illness. Complained at onset of slight headache, fever and nausea with pains in neck and back. On the second day temperature was higher (101° F.); appetite poor; slight nausea and vomiting; difficulty in sitting up in bed because of weakness of back. Seen in consultation by S. M. on third day. Temperature 102° F. Definite weakness of right leg; both arms slightly involved, and impairment of movements of the diaphragm and lower intercostal muscles. Neck rigidity

present; Kernig's sign present; abdominal reflexes absent. Patient given 20 c.cm. serum intramuscularly and admitted to hospital where intravenous therapy with soluble M. & B. 693 was begun. Placed in iron lung because of respiratory distress; serum and soluble M. & B. 693 repeated. Further progress has been satisfactory and patient is out of iron lung.

CASE 3.—Male aged 8 years; previous health good. Illness started with headache and pains in back; slight fever. Next day pains in back much more severe; weakness in both arms. Seen on third day; temperature 102·5° F.; obvious neck rigidity; pains in back severe; both arms very weak; already moderately severe respiratory distress present; both diaphragm and intercostal muscles involved. Patient was immediately given 15 c.cm. of serum intramuscularly and 1 g. of soluble M. & B. 693 in saline intravenously, and was put in iron lung. Serum and soluble M. & B. 693 were repeated according to plan and there was no further nerve involvement.

CASE 4.—Female aged 21 years. Began with pains in neck and head, but was able to carry on work for first and second day. Very exhausted at end of second day and pains much worse. When first seen on the third day temperature 103° F., pain and slight rigidity of neck muscles; pain running down back; slight paresis of left leg; both knee-jerks and ankle-jerks absent; Kernig's sign positive. Given serum and M. & B 693 according to scheme. On the evening of the fifth day (third day of treatment) temperature fell to normal. No further extension of paralysis. Convalescence uneventful. No appreciable weakness remains.

This is intended as a preliminary to a more complete report.

SINCLAIR MILLER,
STANLEY WRAY.

Harrogate.

RECURRENT CHICKENPOX

SIR,—In view of Dr. Crisp's letter in your issue of Sept. 7 about recurrent chickenpox it may be of interest to say that my eldest boy aged 13 has just recovered from his fourth attack of typical chickenpox. He had three attacks before he was five years old, and curiously enough when he was six years old his sister had her only attack of chickenpox but he did not develop it. The last attack was accompanied by severe constitutional disturbance, the temperature ranging from 102° to 103° F. for two days just before the spots appeared. Second attacks are quite well known, but I imagine that four attacks must be very uncommon. For the first three attacks the source of infection was known quite definitely, and the last attack was probably caught at a cinema.

Winsford, Cheshire. W. N. LEAK.

GUILLOTINE AMPUTATIONS

SIR,—During the past six years 96 major amputations have been performed at Walton City Hospital, Liverpool. In 5 of these cases it was considered advisable to amputate by the so-called guillotine method. In each case the amputation was carried out at the lowest possible level—that is, at the site of gross infection—and in each case the operation was one of urgency and done for the purpose of saving life. One patient died on the day following operation. In each of the other cases the after-treatment was carried out very much on the lines laid down by Mr. Watson-Jones in your issue of Aug. 10. In none of these cases has the subsequent progress corresponded to the dreadful picture painted by Mr. Ogilvie. Of the two mid-thigh amputations the first required a skin graft 2 in. by 4 in. performed six weeks after amputation and the patient walked well with an artificial limb after six months (fig. 1). The second healed with a rather conical stump and the epithelium was adherent to the lower end of the femur so that occasionally the skin breaks down and he has to keep a small dressing over the stump. Nevertheless he wears an artificial limb, has refused re-amputation and is now on munition work. The two amputations below the knee will each require a further operation before they can be regarded as satisfactory end-results (figs. 2 and 3). I have also under my care a soldier who was the subject of a below-the-knee guillotine amputation by a French surgeon, in May of this year, which is healing so well that there seems a definite possibility of further operation not being required (fig. 4).

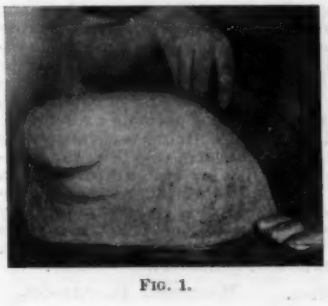


FIG. 1.

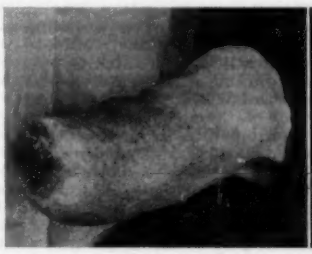


FIG. 2.

FIG. 3.

FIG. 4.

Healing is always slow in this amputation but as a means of obtaining the longest possible stump under difficult conditions I am completely convinced that the guillotine amputation has a place in surgery.

Liverpool. W. S. DIGGLE.

BACTERIOSTATIC ACTION OF SULPHANILAMIDE

SIR,—Of the various theories of the mechanism underlying the action of the sulphanilamide compounds the most probable, in our opinion, are those of D. D. Woods, Fildes, and Lockwood and Lynch. These have as their basis the fact that *p*-aminobenzoic acid and peptone act as inhibitors of the bacteriostatic action of sulphanilamide.

The bacterial cell, in common with other living organisms, if it is to keep alive must carry out various metabolic activities which require the presence of certain enzymic systems, varying with the type of bacteria. It has been established that animal and plant enzymes are susceptible to the action of certain poisons—e.g., cyanides and urethanes—which inhibit their activity. We suggest that the action of sulphanilamide is similar. From the work of Lockwood and Lynch, and others, it is probable that the enzymic system affected by sulphanilamide is that concerned with the metabolism of nitrogen, which takes place through the intermediary of *p*-aminobenzoic acid and peptone in the case of *Streptococcus hæmolyticus*. We suggest that the rôle of *p*-aminobenzoic acid and peptone is to form, with the appropriate enzymes, an enzyme substrate complex by virtue of the three chemical factors—NH_2, COOH, and the benzene nucleus. The enzyme substrate complex is then catalytically broken down with the liberation of the enzyme, which is free to combine with further appropriate substrate, and easily assimilable nitrogen necessary for the life of the organism.

If we examine the chemical structure of sulphanilamide it is seen that only two of these chemical factors—NH_2 and the benzene nucleus—are present. It has been shown that substances with related chemical structure to that of the normal substrate can combine with the enzyme. The enzyme substrate so formed does not

break down, thus preventing the enzyme from combining with the true substrate. This "dog-in-the-manger" action is well known in biochemistry as "competitive inhibition." In view of this, it is reasonable to assume that sulphanilamide can combine with the same enzyme or enzymes of the bacterial cell to form an enzyme substrate complex which is not broken down and prevents the enzyme so combined from reacting with the true substrate (*p*-aminobenzoic acid and peptone).

In experiments by the workers already mentioned, the addition of *p*-aminobenzoic acid or peptone to a culture of *Strep. hæmolyticus* to which had been added sulphanilamide inhibited the bacteriostatic action of the drug, this being demonstrated by counting colonies after plating out. This can be explained by the fact that there is competition between the two substrates—i.e., *p*-aminobenzoic acid (or peptone) and sulphanilamide—for the enzyme. Therefore the formation of the enzyme substrate complex will depend on the relative concentration of these substrates. It is this which is probably responsible for the anti-sulphanilamide effect of *p*-aminobenzoic acid.

RICHARD H. BRACEY,
Liverpool. MAURICE SHAPERO.

SHOCK AND THE SYMPATHETIC SYSTEM

SIR,—The hypothesis originally advanced by N. E. Freeman (*Amer. J. Physiol.* 1933, **103**, 185) that the collapse of the circulation in surgical and traumatic shock is due to overstimulation of the sympathetic nervous system is gradually receiving recognition. Stimulation of the sympathetic produces a train of effects identical with the symptoms of shock: the blood-sugar is raised; the cutaneous and splanchnic vessels are constricted, thus accounting for chilliness and pallor and the primary rise in blood-pressure which often occurs; the vessels of the skeletal muscles are dilated, accounting for the subsequent fall in blood-pressure and ultimate collapse; the pupils are dilated; and the secretion of cold sweat is increased.

The stimulation of afferent nerves with the production of pain causes sympathetic activity; the effect is reflex via the posterior roots and the white rami communicantes of the sympathetic. Although general anæsthesia may abolish the connexion between the posterior and anterior roots, the connexion between the posterior roots and the white rami is unaffected. This accounts for the fact that shock develops during many surgical operations despite general anæsthesia. Spinal anæsthesia blocks both connexions and C. H. Evans (Spinal Anæsthesia, New York, 1929) states that it not only prevents further shock developing in severely injured patients (those with badly crushed limbs, for example) but actually diminishes shock already present. This is accounted for by the fact that in shock the sympathetic nervous system is receiving an abnormal flood of stimuli; when these stimuli are diminished by spinal anæsthesia the blood-pressure tends to return to normal. On the other hand, in the absence of shock spinal anæsthesia causes a fall in blood-pressure by interfering with the reception of the flow of normal stimuli and consequent loss of splanchnic tone. It has been claimed that in many cases spinal anæsthesia fails to prevent shock, but it should be remembered that the patient must be kept with the head lower than the buttocks throughout the period of anæsthesia, otherwise, owing to the loss of splanchnic tone, he is liable to "bleed to death" into his own abdominal vessels. Spinal anæsthesia, in fact, produces the state of affairs envisaged in the old and erroneous conception of shock in which the bulk of the blood was assumed to stagnate in the abdominal vessels. Actually it is in the dilated skeletal muscles that the blood stagnates with a consequent fall of blood-pressure. The walls of the dilated capillaries then become abnormally permeable from want of oxygen, and an increased amount of blood plasma passes into the tissues from the circulation, so that the blood becomes concentrated and the blood-volume diminished. The amount of blood reaching the right side of the heart is thus seriously reduced, and oxygen-want and asphyxiation of the body cells result.

Freeman has shown that when the sympathetic nervous system is paralysed by ergotoxin intravenous adrenalin does not cause a fall of blood-pressure. I have suggested (*Lancet*, 1937, **2**, 1416) that in addition to the usual measures shock can probably be treated successfully in the early stages by ergotoxin, preferably given intravenously, and by the inhalation of warm oxygen. This is supported by the recent successful use by A. Hassan and A. H. Mohammed (*Lancet*, 1940, **1**, 1001) of ergotoxin as an antidote for scorpion toxin, which is among other things a strong sympathetic stimulant.

General anæsthesia is best induced in shocked patients by a mixture of nitrous oxide, ether and oxygen because the oxygen tends to diminish the tissue asphyxiation.

Cape Town. J. WALKER TOMB.

*** We should like to be assured that ergotoxine can be given without risk to shocked patients in the way suggested. In anæsthetised animals the sympathetic is only paralysed by poisonous doses of ergotoxine.—ED. L.

INDUSTRIAL TUBERCULOSIS

SIR,—Dr. Jessel's letter in your issue of Sept. 7 surely misses the main purpose of miniature screen photography which is to detect early pulmonary lesions before the appearance of symptoms. Its limitations and, indeed, the limitations of ordinary X-ray examination of the chest are too well recognised to require comment. The advocates of miniature screen photography for mass examination merely claim that this method is the best known, most practicable and economic single means of detecting pulmonary lesions in presumably healthy subjects, among for example recruits and industrial workers. Lesions detected at this stage are obviously macroscopic and the established finer diagnostic procedures must be utilised in order to determine their exact ætiology and clinical significance.

As an example of the practical possibilities of this method it is only necessary to refer to Lieut.-Colonel E. L. Cooper's contribution on pulmonary tuberculosis in recruits published in the *British Medical Journal* of Aug. 24. Its extension to the industrial community enlarges its possibilities enormously and mass surveys show that a considerable number of early cases are to be found among asymptomatic subjects. Instead of waiting until tuberculosis is suspected or until the factory medical officer detects obvious signs of ill health, the worker, while still quite free from symptoms, is discovered by annual routine mass surveys to have an early pulmonary lesion and can immediately be given, if necessary, treatment adequate to impede the advance of the disease. The very real need for such a health maintenance programme is demonstrated by the experience of the Metropolitan Life Insurance Company of America whose annual preventive health examinations of 17,700,000 industrial policy holders has resulted, in the last twenty-five years, in a reduction of both incidence and mortality-rate of pulmonary tuberculosis far greater than in the general population.

It is surely the responsibility of the state to facilitate such a progressive scheme and at the same time—and here I agree emphatically with Dr. Morgan—to ensure that no worker should in such circumstances be victimised by society.

Wimpole Street, W.1. PHILIP ELLMAN.

TRAINING IN ANÆSTHETICS

SIR,—It has been my privilege to work as an anæsthetic nurse at the department of anæsthetics for the past twelve months during which time I have learnt the many complications and emergencies which arise in the experience of every anæsthetist. Consequently, my knowledge of how to deal with these complications and the unconscious patient has increased considerably. In an emergency therefore—e.g., at a clearing station, or in any situation where the number of patients exceeds the supply of doctors—I could be of more assistance to a qualified anæsthetist than someone who was not continually working in this sphere, and I feel that a sister-anæsthetist is a needed addition to the theatre staff of every large hospital. Such a woman would only be chosen after a recognised training—e.g., two years with an examination at the end—which would prove her ability to act as assistant to a qualified anæsthetist.

Radcliffe Infirmary, Oxford. WINIFRED PARKINSON.

A REINFORCED LOAF

SIR,—Sir Ernest Graham Little's statement in your issue of Aug. 10 that "there will probably be general agreement that the organic vitamin is in every respect superior to the synthetic product" has already been answered. I should like to emphasise that by every test which has been applied to the synthetic vitamin B_1—chemical, physical and biological, including clinical treatment in man—no difference between the natural and synthetic product is detectable. The statement is therefore without foundation.

Some 30 years of patient research in laboratories throughout the world have led to the final achievement of the chemical synthesis of one of the most important compounds in nature. The labours of at least one laboratory were sustained by the thought that in another blockade we need not depend absolutely on nature for our supply nor live under the threat of vitamin-B_1 deficiency. It is remarkable that there should still be opposition to the use of the synthetic vitamin, and this opposition goes far to support an uneasiness that there is likely still to be futility in our application of scientific knowledge.

It is important to keep the two problems distinct: (1) whether a wholemeal (or more wholemeal) bread is better than white; and (2) whether nutritious substances artificially removed or not present for other reasons should be restored to the foodstuff (reinforcement). Most scientists would think that the substitution of finely-ground wholemeal bread for white bread would be a good thing for the population, but even so it could not be assumed that the content of vitamin B_1 would be constant, because the amount in whole wheat is said to vary. I agree with Dr. Joliffe that it is advisable to add vitamin B_1 to all vitamin-free foods, such as white bread, refined cereals, sugar, candy and alcohol in amounts sufficient to bring the vitamin/calorie value of these foods above borderline levels. Other important missing substances should also be supplied.

Whether the public could be educated to like wholemeal bread is a psychological problem; and whether it is more economical to give folk their vitamin B_1 and other food elements missing from white flour in other ways than in wholemeal bread is a problem in war economy. One thing is clear—they must have their proper amount of this vitamin somehow.

Department of Biochemistry, Oxford. R. A. PETERS.

RELAPSING CEREBROSPINAL FEVER

SIR,—Prompted by Dr. Trevor Thomas's note in your issue of Sept. 7 on the failure of chemotherapy in relapsing cerebrospinal fever, I would like to quote briefly a case with some similar characteristics.

The patient, a boy of seven, was admitted to hospital with typical signs of cerebrospinal meningitis including a petechial rash. The cerebrospinal fluid obtained from lumbar puncture contained meningococci. During the first twenty-four hours after admission, 40,000 units of Meningococcal Antitoxin (P. D. & Co.) and 5 grammes of M. & B. 693 were given. During the next seventy-two hours 12 g. of M. & B. 693 were given. On the fifth day all symptoms and clinical signs had disappeared and M. & B. 693 was discontinued. On the sixth day patient complained of pain in the right knee and thigh. On examination the knee and thigh were swollen. There was no increased local heat and there was no fluid in the knee-joint, but there was marked limitation of movement of the joint. The temperature rose to 99° F. A diagnosis was made of embolic non-suppurative arthritis of the knee-joint and embolic abscess in the thigh. Local treatment was applied in the form of a back splint and glycerin and ichthyol dressings. The temperature varied between 98° and 100·8° for three days and then settled. The local condition also seemed to subside.

Fourteen days later the condition recurred with previous severity and the temperature began to fluctuate between 97° and 101°. The patient looked ill and complained of anorexia. Antiphlogistine poultices and hot hip baths were given without effect. After fourteen days M. & B. 693 therapy was begun. For six days 3 g. were given daily and 1½ g. on the seventh day. The drug was badly tolerated and gave rise to nausea and vomiting. There was no improvement in the local condition and the temperature continued to fluctuate.

A week later Prontosil Rubrum was given in doses of 3 g. in twenty-four hours for seventy-two hours, followed by 1½ g. in twenty-four hours for a further seventy-two hours. The drug was then discontinued. Within twenty-four hours of the onset of treatment with prontosil, the temperature settled and the affected limb improved. At the end of the course the limb was normal except for some limitation of movement of the knee-joint, which was overcome by non-weight bearing exercises and massage. There was no evidence of intolerance to prontosil and the patient was able to take full diet during the course of treatment. Within a week of completing treatment the patient was walking fairly well.

The history of this case confirms the opinion that the meningococcus can become "sulphapyridine fast" and further suggests that other sulphonamide drugs may prove effective when the originally used preparation fails.

Swansea. MURIEL BANNISTER.

TREATMENT OF BOILS

SIR,—The treatment of boils has left much to be desired. The routine local applications are uncomfortable and do not seem to shorten the course of the disability. An autogenous vaccine is only sometimes effective and the same applies to injections of colloidal manganese. On sea voyages the boil incidence is relatively high and a laboratory is not available, and during some seven years at sea it has seemed to me that something further could be done. The definite facts appeared to be that carbuncle is associated with diabetes and that transient glycosuria is often associated with carbuncle. It seemed possible, therefore, that insulin might benefit boils. Three years ago I tried giving a daily dose of ten units before the midday meal. The results were excellent. Even in severe conditions six consecutive doses were adequate. Incipient lesions disappeared; developed ones regressed and healed. After the first few cases local treatment was limited to a protective covering with dry lint. Squeezing the boils was firmly forbidden. Twenty-seven cases have now been treated. One severe case relapsed after a month but cleared up at once on repeating the injections. Of fifteen urines tested one gave a strong and two a weak positive reaction with Benedict's solution; in all three the reaction became negative during treatment.

St. John's Wood, N.W.8. W. MILLER.

MUSCULAR DISORDERS AND NUTRITIONAL DEFICIENCY

SIR,—In his letter of Sept. 7 (p. 311) Professor Taylor casts doubt on my theory that muscular dystrophy is a deficiency disease curable by wheat germ—probably on account of its vitamin-E content. His dystrophic patients in Lahore come from a district where coarsely ground wholemeal wheat-flour is eaten so he argues that the theory is false or they would have been protected against muscular dystrophy. Consideration of the following points will, I hope, remove his doubts.

(1) The individual's needs for a particular vitamin may, for no obvious reason, be far in excess of any provided by normal diets. For instance an abnormal need for vitamin D has often been reported. F. Albright and others (*Amer. J. Dis. Child.* 1937, **54**, 529) had a case where over a million units a day had to be given instead of the usual one to three thousand. In other words the child could have only satisfied his needs at family meals by daily eating about 20 times his own weight of the "best butter." But he is no argument against rickets being a deficiency disease.

(2) Rancid fat in the diet destroys vitamin E. Weber and others (*Amer. J Physiol.* 1939, **125**, 593) found that in rats rancid fat mixed with a diet containing three times the normal requirements of vitamin E caused its destruction, the rats becoming sterile. I believe rancid fat is largely used in India in which case it probably destroys much of the vitamin E in the diet.

(3) The fact remains that wheat germ does cause dystrophies slowly but steadily to improve. This improvement has now gone on for over two years in one of my cases, and I have not seen any which have not got better with persistent treatment apart, possibly, from one mentally deficient boy.

Many personal communications also support my own observations.

Several hospitals in India are now using wheat germ, so Professor Taylor will be able to check the results of treatment for himself.

London, W.1. FRANKLIN BICKNELL.

SIR,—Professor Taylor raises the point that the population in Lahore consumes wholemeal wheat flour, coarsely ground and lightly cooked. This may be expected to supply their full vitamin-E requirements and yet the muscular dystrophies occur commonly among them. This fact, he suggests, throws doubt upon the relationship of vitamin-E deficiency to these diseases. There is, however, another factor which may merit consideration. Ghee made from either the liquid part of melted butter or from the more solid fraction, mixed with ground-nut oil, is a very common article of diet in India. The heat causes it to become rancid very rapidly and it is often kept over long periods. Certain vegetable agents are in common use to mask its rancid taste. Vitamin E is rapidly destroyed in the presence of rancid fats and where ghee is used to any extent it must be responsible for considerable loss of vitamin E. The prevalence of muscular dystrophies might thus be an expression of partial vitamin-E deficiency even in this whole-wheat eating population.

Research Laboratories, Vitamins Ltd. M. D. WRIGHT.

BLAST INJURIES TO THE LUNGS

SIR,—The experimental investigation described by Zuckerman in your issue of Aug. 24 helps to explain the cases which were observed by others and myself during the Spanish war. In a number of patients in Spain clinical symptoms were scanty while subjective statements led to the suspicion that some damage to the lungs had occurred, but at that time one had no clear conception of the changes in the lungs. We should bear in mind that lungs already affected by disease (generalised emphysema, tuberculosis, anthracosis, pleural adhesions and so on) are more susceptible to blast than sound ones, since the previous affection may either be aggravated or be partly responsible for the injury. Referring to the hypothesis that blast injuries to the lungs are mainly due to the high-pressure wave of the blast, we were guided by the following experiences towards the acceptance of this theory. It has been noticed that at the moment when the impact strikes the body wall, compressing the thorax and driving the diaphragm into the pleural cavity, a reflex closure of the epiglottis results, accompanied by a hiccuping sound. If the theory of the epiglottis action is proved correct the possibility of the suction wave as a primary cause would be excluded. The closure of the epiglottis at this moment would tend to increase the damaging effect of the high-pressure wave on the lungs, since the compressed air in the lungs would have no possibility of escape.

Zuckerman's enlightening experiments are of vital importance at this time.

Huyton. C. H. KRETZSCHMAR.

Outpatient departments for psychiatric patients of both sexes and for children exhibiting conduct disorder have been carried on at the Maudsley Hospital at Denmark Hill since the outbreak of war. But the air-raids in London have interrupted the attendance of patients and have added to the difficulty of providing medical attention, and it has been decided to suspend the outpatient sessions until further notice.

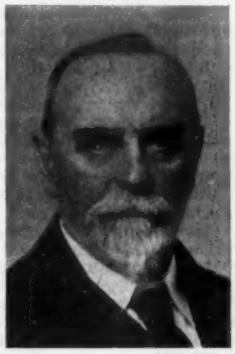
The London office of the Medical Sickness Annuity and Life Assurance Society has been almost completely destroyed by enemy action. The society's records were removed at the beginning of the war to Highfield, Chesterton, Cirencester, where the normal work has been carried on, and only a skeleton staff were in London. Temporary accommodation has been obtained at 119, Harley Street, W.1, and all inquiries as to new business should be addressed there. Members who posted letters to the London office between Sept. 4 and 8 are advised to make inquiries if they do not receive a reply as any post delivered over the week-end has probably been lost in the destroyed building.

Obituary

EDMOND WILLIAM WACE CARLIER

B.-ÈS-S. UNIV. FRANCE, M.D. EDIN., M.SC. BIRM.

On Sept. 3 Dr. Carlier, emeritus professor of physiology in the University of Birmingham, died at his home at Dorridge in his eightieth year. He was born at Norwich, the only son of A. G. Carlier, officier d'Académie. From King Edward's School, Norwich, he went to the Lycée de Valenciennes and graduated B.-ès-S. in 1882. He returned to this country to study medicine at Edinburgh, where he graduated M.B. with honours in 1886. While working as assistant to William Rutherford, the professor of physiology, he was awarded the gold medal for his M.D. thesis in 1891. In 1894 he was appointed lecturer in experimental physiology and histology at Edinburgh, and at Rutherford's death in 1899 he became interim professor and examiner in physiology till Schäfer was appointed to the chair. Carlier then left Edinburgh to take up his own new appointment as professor of physiology in Mason College, which in 1900 became the University of Birmingham. From 1909 to 1914 he was examiner in physiology for the Royal College of Surgeons of England. He retired from his chair in 1927 on reaching the age-limit. He was a fellow of the Royal Society of Edinburgh and of the Entomological Society, and while in Edinburgh he was hon. secretary to the Scottish Microscopical Society.



Elliott & Fry.

A man of fine appearance he commanded the respect of his students and colleagues. His research was mainly in histology and his early interests as a naturalist are shown by his publications on the histology of wild animals and birds in the British Isles. He made a special study of the hedgehog. On several occasions he served as president of the Birmingham Natural History Society, and read many papers on entomology before this society. After his retirement he continued his research on the lepidoptera and was often a visitor to the biological departments of the university.

C. L. E. writes: Carlier was a shy man, and in no way a self-seeker, but he had an equability of temperament and a genuine charm. Two keys to his character were his French descent and his love for everything military. He would have joined the army as a professional soldier but as a boy his health was delicate. He was a naturalist born, and an instinctive collector, particularly of things such as butterflies, flies and beetles, and it is not surprising that the branch of physiology in which he took the greatest interest was its stepchild, histology. It cannot be said that Carlier achieved distinction among physiologists, probably because such distinction meant very little to him. Owing to an unfortunate misunderstanding he was not elected to the Physiological Society at the time of his adoption as professor of physiology at Birmingham, and although he cared little about this, it did him harm because, added to his retiring nature, it kept him from knowing, or being known, by most of his contemporaries in his own subject. In his later years he did join the society, but only because Halliburton used his kindly influence to persuade him to do so—and it was then too late for him to benefit by his membership. It was characteristic of Carlier's kindly and generous spirit that he held no personal animosities as a result of the affair.

THE following service casualties have been announced:—

Missing.—Temp. Surgeon Lieutenant J. F. Newman, R.N.V.R., H.M.S. *Esk*, and Temp. Surgeon Lieutenant A. C. Shelford, M.B., R.N.V.R., H.M.S. *Express*.

Prisoner of War.—W.S. Captain P. B. Barker, M.B., R.A.M.C.

Wounded.—Major T. E. Elliot, M.B., R.A.M.C., and Lieutenant F. G. Hibbert, M.B.

PROFESSOR HANS ZINSSER

Dr. Zinsser, who died in New York on Sept. 4 at the age of 61, held the chair of bacteriology at the Leland Stanford Jr. University, at Columbia University, and at Harvard University. He was closely concerned with the problems of infectious diseases engendered by war and his counsel and the resources of his laboratory were put freely at the disposal of those responsible for the defence of his own country and of the British Isles. Lately he had given much help in planning the Harvard medical unit, now in this country, and only illness prevented him from taking a more active part. In the last war he served in the United States army, organising the service for the control of communicable diseases among the newly recruited troops at home and later in France. His epidemiological studies took him also to Serbia, Russia, Mexico and China, and he was a convinced internationalist who held that the humanities and science could not be banished from among us by the clash of arms. Speaking in London four years ago at the banquet of the second International Congress of Microbiology he said :

> And may some political Leeuwenhoek discover a microscope by which he can see and define the little animalculæ of enmity and hatred and savagery, so that at last, in international congress assembled, wise men may sit in peaceful assembly planning research into the virulences of human stupidity and consider measures of active immunisation, chlorination, and delousing for international politics as we do this for infectious disease.

An American colleague testifies that it is as a human being that Hans Zinsser will be remembered by those who knew him best—outspoken, courageous, independent, and lovable. He was a poet of no mean ability and under a pseudonym contributed many articles to leading American periodicals. Of his last book, which has just been published in America under the title " As I Remember Him," Dr. Peyton Rous wrote to Sir John Ledingham : " Zinsser's book is now on the counters and all the reviewers sing delightedly. Which is as well, for he, poor fellow, is in a bad way with lymphatic leukæmia. That is why he looked so haggard when you saw him last September and why the book was written in its special way. He is intent on realising that he has lived, and the book is his testament. Also he tries still to live as hard as ever and finds solace in that." Zinsser was also a musician of more than average ability. But he was primarily a scientist and his field observations on typhus fever were outstanding. He embodied them in his book " Rats, Lice and History," which has been described as the biography of typhus. His recent studies include work on the rickettsias and on the development of vaccine applicable for mass protection. He was also a skilled clinician in infectious diseases and his breadth of interest is reflected in the activities of his students, who are to be found in experimental laboratories, working in field epidemiology, or engaged in clinical practice.

We have received an appreciation of Prof. Zinsser from Sir John Ledingham in which he writes : " Neither in his work nor in his play did he spare himself. In Harvard medical circles, where he was familiarly and affectionately known as Hans, his personality and versatility of genius made him a real power and his place in their councils will be hard to fill. The department over which he presided has long been known as one in which research took a foremost place and workers from many lands found congenial facilities for study. . . . My last conversation with him was at a private dinner before the official opening of the third International Congress for Microbiology on Sept. 2, 1939, in New York, and though one could see that he was a sick man he certainly did not show it in his speech, for he was his cheerful self and made eager inquiries about the prospects of a European war which was fated to commence only a few hours later. Since then it would seem he has thrown himself into the book whose reception by the American public must, as Rous writes, have greatly cheered him. Doubtless it will charm his many friends here and in the France which he loved, and help to keep fresh the memory of a brave spirit. Ave atque vale."

Notes, Comments and Abstracts

SOLDIERS' DOCTOR

IN his Honyman Gillespie lecture in Edinburgh last week, Colonel D. S. Middleton, F.R.C.S., spoke on the work of a regimental medical officer. He said that the M.O. found the quality of his undergraduate training as well as his initiative and personality tested severely. By being brought into contact with both the preventive and the corrective stages of medicine he learned much which would benefit him in subsequent civil practice. He must become to some extent a soldier, at least so far as discipline was concerned. His influence for good in any unit was great if he conducted himself well, but the M.O. who was late for parades and slovenly in dress soon forfeited the respect of his men. As a soldier he had to develop a good general knowledge of the tactics employed by his unit if only in order to work out means of evacuation of wounded. He must be a master of map-reading and must be able to memorise a map in order to make his way about country in the dark and to direct the evacuation of wounded men. Furthermore, he must be able to teach all this to his stretcher bearers. The hygienist, working through the M.O., was nowadays a more important person than the army surgeon. The enormous reduction in the incidence of preventive disease in modern campaigns reflected this, but it was important to remember that since the commanding officer depended on the M.O. for the health of his men the latter must have an intimate knowledge of the details of the men's life. Not only must the M.O. know the ordinary clinical features of disease, including tropical diseases, but he must be conversant with the means of transmission of infections and infestations and with the means of prevention. In his own unit the M.O. had great power relative to his rank, and slackness on his part might not only permit the entry of serious disease to that unit but might spread to others. There were several problems occupying attention in the R.A.M.C. just now. The first of these was ventilation. With the present large garrison army there was considerable difficulty in ensuring proper ventilation in billets, huts and barracks, particularly in relation to the blackout. The outbreak of cerebrospinal meningitis was partly attributed to ventilation troubles, but it must be remembered that the army was not more seriously affected than the civil population. The second current problem was that of water. The recent civil outbreaks of enteric fever had shown that, especially for country districts, water supplies might not be perfect. All non-municipal sources of supply to the army must now be chlorinated. The M.O. must know about transport of water and about the purification of small quantities of water, even that in the private's water-bottle.

Turning to the collection and evacuation of casualties in the field, Colonel Middleton said that the method developed during the last war might still be useful during the early stage of an invasion. But during air attack civil and military services would be pooled, casualties being collected and evacuated through first-aid posts to base hospitals under the Emergency Medical Service. Under these circumstances the main problem would be that of transport and the M.O., finding himself inadequately supplied, might have to requisition all kinds of emergency vehicles. The really important thing for a M.O. is to get his casualties admitted to a properly surgically equipped hospital in the shortest possible time. Undue attention to first-aid might delay urgent evacuation. He drew attention to the dangers associated with the widespread use of tourniquets by non-medical men and to the necessity for avoiding the over-heating of shocked patients. The M.O. had an important function in the classification of wounded for deciding on priority of evacuation. The M.O. should watch carefully the progress of recruits who were slightly below physical standard. He should obtain extra food for them and save them from the hardest work at the beginning, thus assisting in the rehabilitation of many sub-standard men.

On the vexed question of the clerical work required of army medical officers, Colonel Middleton pointed out the individual records of the M.O. constituted the basis

for all the statistics on which war-casualty analyses were built. Furthermore, an entry in the M.O.'s admission book might be the sole evidence in support of a later claim by a man for a pension. A medical officer sometimes complained that he had not enough to do. This was due to an entirely wrong outlook on his true functions; he was there to keep a close eye on the health of all the men in his unit and to prevent rather than cure ill health. The same criticism applied to those who were not satisfied with having only a few sick parades and who wanted to be real doctors. Medical officers usually were the only men in the officers' mess who were doing anything like their peace-time work, and all their colleagues felt even more acutely the divorcement from their civil occupations.

HOME AND EMPIRE DRUGS

AN official medical committee which has taken up the question of the production of vegetable drugs in Great Britain at the point where the Ministry of Health appear to have left off has recommended that, in addition to belladonna, digitalis, hyoscyamus and stramonium, steps should be taken to produce other drugs named in a list, some of the items in which are starred as being of "special importance." It is understood that these recommendations are being considered by the Board of Agriculture and other Government departments. The starred drugs are: anethum, chondrus (Irish moss), colchicum, filix mas, liquorice and peppermint. The other drugs in the list are: taraxacum, caraway, chamomile, valerian, hamamelis, pyrethrum, psyllium and fennel. It is also recommended that both *Digitalis purpurea* and *lanata* (for digoxin) should be cultivated in Great Britain and also *Datura tatula*. It is a further recommendation that steps should be taken to encourage the collection of seaweeds, for the extraction of iodine.

The committee has also advised that encouragement should be given to the production of a considerable number of drugs within the British Empire. The starred items in this list are: agar, benzoin, camphor (natural and synthetic), cascara sagrada, cinchona, creosote, ephedrine (natural and synthetic), ipecacuanha, menthol (natural and synthetic), turpentine, colophony, santonin, squill, thymol (natural and synthetic) and tragacanth.

Many of the drugs included in the two lists are among those which the committee has specified as not being so essential as to justify importation or manufacture in war-time, but the committee consider that they should not be discarded indefinitely.

THE TRUBY KING DOCTRINE

Miss Mary Truby King's "Mothercraft" (7th ed. Whitcomb and Tombs, 4s.) is alternative rather than complementary to Miss Liddard's "Manual," annotated on p. 140 of our issue of Aug. 3. Though the doctrines are the same they are expounded with a difference. This book opens with a short biography of Sir Truby King leading to a definition of "a real Truby King baby." Instruction is diversified by citations of minor poetry and paragraphs from mothers' letters. Miss Truby King gives more space than Miss Liddiard to breast-feeding, describing its technique in greater detail and dealing faithfully with the common excuses for needless weaning; here and there, too, the reader is warned that averages are but averages and is urged to "individualise her baby"; but the advice is not pressed home. The terms "overweight" and "underweight," "correct food" and "correct amount"—meaning what is prescribed in this book—are freely employed, and those misleading tables of weight for age and quantity for age, which mothers revere, study and apply with thoughtless zeal inevitably appear. The very paragraph on "individualising" is followed by the statement that "a baby weighing 7¼ lb. at birth should be between 15 and 15¼ lb. at 6 months," and the ipse-dixit rule of "no night feeds" is considered to be of such universal application that the distracted mother of a night-crying baby, having tried napkin-changing, opening the window, an ounce of warm boiled water, "wind-in-the-stomach" remedies (including taking the child from his cot and holding him up) is advised, "if the abdomen is distended," to give him an enema at 105° F. and to consider seriously in the morning whether he is being overfed. One thing only is anathema: neither breast milk nor cow's milk may be given. It seems that no baby can be hungry in the night.

CORAMINE.—The General Medical Council have proposed including pyridine-β-carboxylic acid-diethylamide in an addendum to the B.P. 1932 with the name of nikethamide. Pyridine-β-carboxylic acid-diethylamide was originally placed on the market with the name Coramine. Ciba Limited, who continue to supply coramine, point out that this preparation is manufactured under a British patent and that the name is a registered trade mark. We much regret if the note on page 316 of our issue of Sept. 7, when coramine was referred to as "the former proprietary preparation," has suggested otherwise.

Medical News

University of Cambridge

During July titles of the degrees of M.B. and B.Chir. were conferred on the following members of Girton and Newnham Colleges: J. J. H. Beattie, N. G. Clegg, J. Davies Gibbon, M. C. Simpson, and J. F. Thompson.

The Price of Ergot

Since the fall in the price of ergot which brought market values almost to pre-war level the downward movement has continued, and the price is now about a third of that ruling in July. This season's crops in Spain and Portugal have been large, substantial shipments from Portuguese ports have reached this country, and there is no longer a shortage of supplies of the drug.

Pharmacists' War-aid Service

The Pharmaceutical Society has established a special department called the war-aid service to which pharmacists may submit their war-time difficulties. Employment in other districts will be found if possible for the owners of shops that have had to be closed and their assistants, and the transfer of stocks from places where they are not wanted to places where there is a demand for them will be facilitated. In suitable cases financial aid will be given, and for this purpose the scope of the benevolent fund has been extended by the establishment of a war-aid fund.

Appointments

BUTTERWORTH, JOAN, M.B. Lond., D.P.H.: asst. tuberculosis officer and R.M.O. at Frenchay Park Sanatorium, Bristol.

CAMPBELL, RUTH, M.R.C.S.: asst. M.O.H. (maternity and child welfare) for Halifax.

Births, Marriages and Deaths

BIRTHS

ELLIOTT.—On Sept. 15, at Oxford, the wife of Captain John Elliott, R.A.M.C., of Hambleden—a son.

GISSANE.—On Sept. 12, in London, the wife of Mr. William Gissane, F.R.C.S.—a son.

MALLINSON.—On Sept. 13, at Inverness, the wife of Dr. Frank Mallinson, Sittingbourne, Kent—a son.

MARTIN.—On Sept. 12, at Penzance, the wife of Surgeon Lieut. E. Boyd Martin, R.N.—a son.

MCCULLAGH.—On Sept. 5, at Cambridge, the wife of Surgeon Lieut.-Commander Graham P. McCullagh, R.N.V.R.—a daughter.

SQUIRE.—On Sept. 13, the wife of Dr. Christopher Michael Squire—a daughter.

MARRIAGES

EDWARDS—DAVIS.—On Sunday, Sept. 1, at Llanfair, Waterdine, Shropshire, Richmond Edwards, M.B., Lieutenant R.A.M.C., to Mollie Davis.

HERIOT—STACEY.—On April 6, at Wandsworth, Alexander John Heriot, F.R.C.S., to Christine Margaret Stacey, M.B.

MACDONALD—HOVELL.—On Sept. 14, at Rustington, Ian Douglas MacDonald, M.R.C.S., to Anna Hovell.

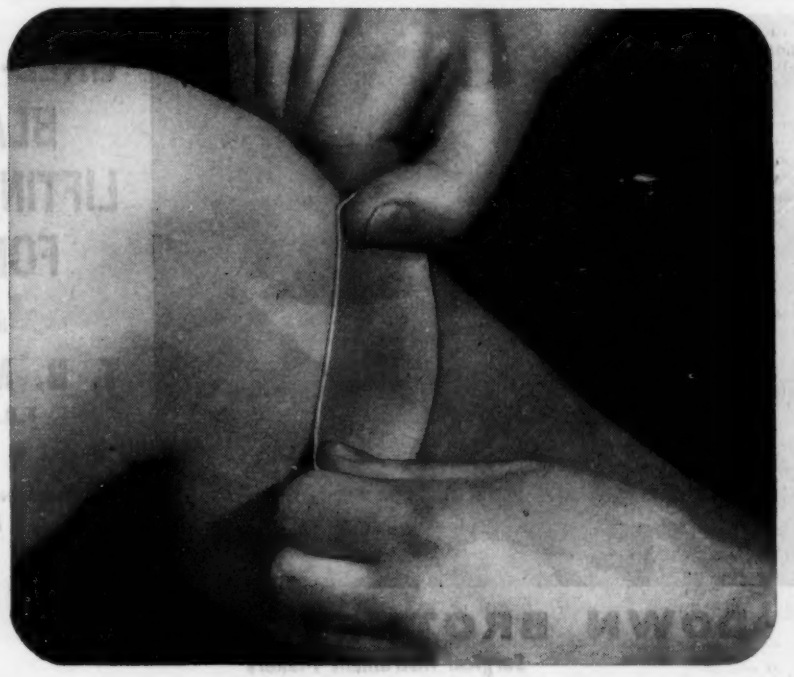
SMILEY—WISE.—On Sept. 11, in London, William Kennedy Smiley, M.B., to Helen Mary Wise.

DEATHS

HEWLETT.—On Sept. 10, Richard Tanner Hewlett, M.D. Lond., F.R.C.P., emeritus professor of bacteriology in the University of London at King's College, aged 75.

PATERSON.—On Sept. 16, in Edinburgh, Alexander Paterson, M.B. Edin., for 30 years medical missionary at Hebron, Palestine.

SHAW.—On active service in the Middle East, John James McIntosh Shaw, M.C., M.D. Edin., F.R.C.S.E., F.R.S.E., Colonel R.A.M.C.



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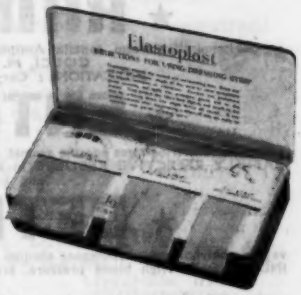

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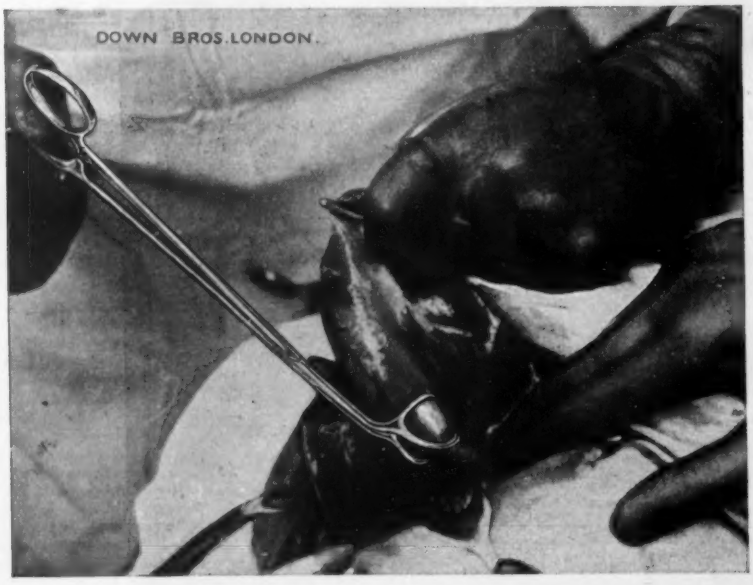

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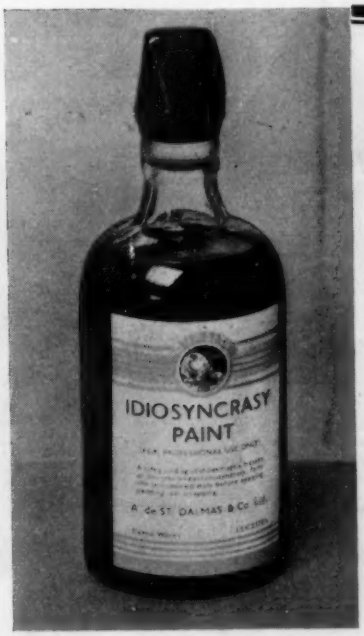

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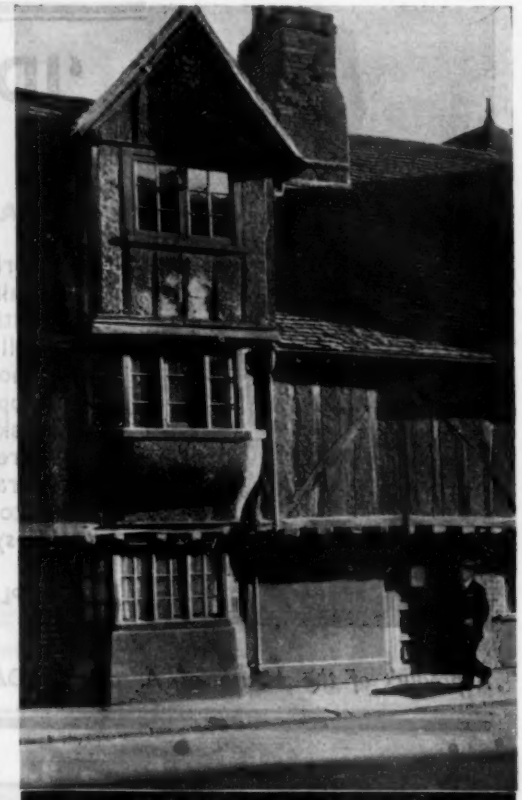

NOTABLE NUMBERS

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ESTABLISHED IN 1853.

A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without Certificates as Voluntary Patients under the provisions of the Mental Treatment Act, 1930. Bracing hill country. See "Medical Directory," p. 2358.—Apply to the Medical Superintendent. 'Phone 10 P.O., Church Stretton.

CHISWICK HOUSE,

PINNER, MIDDLESEX.

Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

THE GROVE HOUSE,

CHURCH STRETTON, SHROPSHIRE.

Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.

Medical Superintendent: Dr. J. A. MCCLINTOCK.

THE COPPICE, NOTTINGHAM.

HOSPITAL FOR MENTAL DISEASES.

President: The Right Hon. LORD BELPER.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. Voluntary and Temporary Patients received. Occupational Therapy. For terms, &c., apply to the Medical Superintendent.

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SHORT WAVE THERAPY

Equipment

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'Phone: BEDFORD 3417. **Near BEDFORD**

For Mental Cases with or without Certificates.

Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

UNIVERSITY OF LONDON, KING'S COLLEGE.

FACULTY OF MEDICAL SCIENCE.

The Medical Faculty at this College of the University gives instruction in the subjects of Medical Science for all the usual Pre-medical and Intermediate Examinations in Medicine, Surgery and Dentistry. Through the four associated hospitals, students of the College have clinical facility of over 1000 beds.

The Medical Faculty of the College provides a GENERAL UNIVERSITY EDUCATION in touch with other Faculties, classes of which medical students are permitted to attend. There are many College societies, clubs, and functions in which students of all Faculties have opportunity of meeting each other. The College has an excellent athletic ground at Mitcham with a new and well-equipped pavilion.

The First Year subjects are taught in the large Departments of the Faculty of Science, and those for the Second and Third Years in the new Medical Department. This includes the Hambleden Department of Anatomy and an extension to the Department of Physiology, recently erected at a cost of £70,000. These new buildings and those of recent years provide the College with a completely new and modern Medical Department, which embodies the newest ideas in laboratory construction and equipment.

Valuable Scholarships and Prizes are awarded on the results of examinations held annually.

The Hostel for Men Students (The Platanes, Champion Hill, S.E.5) contains accommodation for 80 Students. Women Students are recommended to consult the Tutor to Women Students with regard to Hostel accommodation.

For detailed prospectus of the Medical and Dental Courses and for further information apply to the Dean of the Medical Faculty or to

Strand, W.C.2. S. T. SHOVELTON, M.A., Secretary.

ANÆSTHETIC COURSE

(Suitable for D.A. candidates)

An intensive revision course, of theoretical teaching and practical demonstrations, will be given by the Staff of the Nuffield Department of Anæsthetics at the RADCLIFFE INFIRMARY, OXFORD, from October 28th to November 9th, 9 a.m. to 6 p.m. daily. STRICTLY LIMITED TO TEN POSTGRADUATES.

Apply FELLOWSHIP OF MEDICINE, 1, Wimpole-street, London, W.1. (LANgham 4266.)

F.R.C.S. (FINAL) COURSES

PRACTICAL OPERATIVE SURGERY: Royal Cancer Hospital, Mondays, Wednesdays, Fridays, 2 p.m., September 30th to October 25th. PATHOLOGY: Four separate courses (*a*) October 2nd and 3rd, and (*b*) October 9th and 10th, 2 to 3.30 p.m.; (*c*) October 23rd and 24th, and (*d*) October 30th and 31st, 11 a.m. to 12.30 p.m. Each class limited to 6.

Apply FELLOWSHIP OF MEDICINE, 1, Wimpole-street, London, W.1. (LANgham 4266.)

BRITISH POSTGRADUATE MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

Course of Lectures on Miscellaneous War Surgery.

September 30th—October 4th, 1940

MONDAY, SEPTEMBER 30TH.		
10 a.m.	Ailments of the Soldier in Training.	
11.15 a.m.	Nutrition in the Wounded Soldier.	
2 p.m.	War Injuries of the Nose, Throat, and Ear.	Mr. Lionel Colledge, F.R.C.S.
3 p.m.	War Injuries of the Nose, Throat, and Ear (*cont.*).	Mr. Lionel Colledge, F.R.C.S.
TUESDAY, OCTOBER 1ST.		
10 a.m.	Facial Injuries: Plastic Repair.	Mr. R. Mowlem, F.R.C.S.
11.15 a.m.	Facial Injuries: Plastic Restoration.	Mr. R. Mowlem, F.R.C.S.
1.15 p.m.	Bus to Royal College of Surgeons.	
2 p.m.	Demonstration of Specimens at the Royal College of Surgeons.	
WEDNESDAY, OCTOBER 2ND.		
10 a.m.	Skin Grafting	Mr. T. P. Kilner, F.R.C.S.
11.30 a.m.	Boils.	
2 p.m.	Venereal Diseases in War..	Col. L. W. Harrison, D.S.O., F.R.C.P.
3 p.m.	Venereal Diseases in War (*cont.*).	Col. L. W. Harrison, D.S.O., F.R.C.P.
THURSDAY, OCTOBER 3RD.		
10 a.m.	Injury to the Facial Nerve	Mr. T. E. Cawthorne, F.R.C.S.
11.15 a.m.	Sprains, Strains, and Minor Fractures.	
2 p.m.	Preparation for Rehabilitation.	Dr. James Mennell, M.D.
3 p.m.	Co-operation of Surgeon with Dental Officer in the Early Treatment of Maxillo-Facial Injuries.	Lieut.-Colonel S. H. Woods, O.B.E.
FRIDAY, OCTOBER 4TH.		
10 a.m.	Venereal Diseases in War..	Col. L. W. Harrison, D.S.O., F.R.C.P.
11.15 a.m.	War Injuries of the Eye ..	Mr. Charles Goulden, O.B.E., M.D., F.R.C.S.
2 p.m.	War Injuries of the Eye (*cont.*).	Mr. Charles Goulden, O.B.E., M.D., F.R.C.S.
3 p.m.	Demonstration of Plaster Technique.	Lieut.-Col. St. J. D. Buxton, F.R.C.S.

The fee for the Course will be One Guinea, but no fee will be charged in the case of officers of the Armed Forces and Emergency Medical Service who submit a leave certificate and register their names before the commencement of the course.

Applications for tickets should be addressed to the Dean, British Postgraduate Medical School, Ducane Road, W.12.

University of London.

Applications are invited for the WILLIAM JULIUS MICKLE FELLOWSHIP which is of the value of at least £200, and is awarded by the Senate to the man or woman who, being resident in London and a graduate of the University, has in the opinion of the Senate done most to advance Medical Art or Science within the preceding five years.

Applications must be received by 19th October, 1940. Further particulars should be obtained from the Academic Registrar, University of London, at 42, Gyles-park, Stanmore, Middlesex.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

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For Convalescent Patients or those requiring restful holiday combined with Massage, electrical and other Physical treatment. Electric Lift and modern amenities. *Brochure from Medical Superintendent.*

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FENSTANTON, at "FIVE DIAMONDS," Chalfont St. Giles, Bucks.

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (*See Medical Directory*, p. 2346.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

BROOKE HOUSE, CLAPTON

A PRIVATE HOME for the treatment of Nervous and Mental Disorders in both sexes. Situated in nine acres of Pleasure Grounds.

Voluntary, Temporary, and Certified Patients received.

For further particulars apply—

Dr. ERNEST ROLLINS, Resident Physician.

Tel.: Amherst 1642.

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FOR THE TREATMENT OF PULMONARY TUBERCULOSIS

Well situated on high ground and surrounded by pines and heather. All rooms are fitted with electric light, wash basins with hot and cold water, and radiators. X-ray plant. Day and night nursing staff.

RESIDENT MEDICAL SUPERINTENDENT: Dr. H. O. BLANFORD, to whom application for admission can be made.

PORTSMOUTH CITY MENTAL HOSPITAL

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds with sea views.

Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., F.R.C.P.

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Also Fully Trained Nurses for

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ESTABLISHED AT THIS ADDRESS 43 YEARS

MALE & FEMALE

all Cases, Male, Female, & Children

MATERNITY, FEVER, etc.

H. S. STURGESS, Secy.

'Grams: "ABSTAIN, LONDON"

ST. ANDREW'S HOSPITAL

FOR NERVOUS AND MENTAL DISORDERS,

NORTHAMPTON

FOR THE UPPER AND MIDDLE CLASSES ONLY.

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., M.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods: insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment.

CHEADLE ROYAL HOSPITAL, Cheadle, Cheshire.

This REGISTERED HOSPITAL, with a SEASIDE BRANCH at Colwyn Bay, N. Wales, is for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL AND NERVOUS DISEASES.

The Hospital is governed by a COMMITTEE, appointed by the TRUSTEES of the Manchester Royal Infirmary.

In addition to the Main Buildings there are separate villas. Extensive grounds. Hard and grass tennis courts, cricket and croquet grounds, and a court for badminton. There are also wireless installations. Golf may be had within easy distance. Occupational Therapy.

VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS received.

The Hospital is nine miles from Manchester, 50 minutes by rail from Liverpool, and 3½ hours from London.

For terms and further particulars apply to the Medical Superintendent, who may be seen in Manchester BY APPOINTMENT. *Telephone: Gatley* 2231 (3 lines).

CAMBERWELL HOUSE

Telegrams: "PSYCHOLIA, LONDON." **33, PECKHAM RD., LONDON, S.E.5.** Telephone: Rodney 4242 (2 lines).

For the treatment of MENTAL DISORDERS.

Also completely detached Villas for Mild Cases, with private suites if desired. Voluntary Patients received. Twenty acres of Grounds. Hard and Grass Tennis Courts, Putting Greens, Bowls, Croquet, Squash Rackets, Recreation Hall with Badminton Court, and all indoor amusements, including Wireless and other Concerts, Occupational Therapy, Calisthenics, and Dancing Classes. X-ray and Actino-therapy, Prolonged Immersion Baths, Operating Theatre, Pathological Laboratory, Dental Surgery, and Ophthalmic Department. Chapel. **Shock and also modified Insulin Therapy.**

Senior Physician: Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff, and visiting Consultants.

An Illustrated Prospectus, giving fees which are strictly moderate, may be obtained upon application to the Secretary.

The Convalescent Branch is Hove Villa, Brighton, and is 200 feet above sea level.

THE COTSWOLD SANATORIUM

First opened in 1898 and rebuilt in 1925 on the Cotswold Hills seven miles from Cheltenham, for the Treatment of Pulmonary and all other forms of Tuberculosis. Aspect S.S.W., sheltered from North and East, elevation 800 feet. Pure bracing air, SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-ray controlled). TUBERCULINS, and ULTRA-VIOLET RAYS is available when necessary without extra charge. X-RAY plant, Fully Equipped Dental Department, Electric Light Radiators, hot and cold basins and Wireless in all rooms. Up-to-date drainage. Full day & night Nursing Staff. **Terms: 5½ to 8½ Guineas a week inclusive.**

Med. Supt.: GEOFFREY A. HOFFMAN, B.A., M.B., T.C. Dub. *Asst. Phys.:* MARGARET A. HARRISON, M.B., B.S. Lond. *Cons. Laryngologist:* G. N. BARKER, F.R.C.S. Edin., D.L.O. *Cons. Dent. Surgeon:* GEORGE V. SAUNDERS, L.D.S.R.C.S. Lond. *Phone:* 81 & 82 Witcombe. Apply: *The Secretary, The Cotswold Sanatorium, Cranham, Gloucester. Telegrams:* "Hoffman, Birdlip."

COURT HALL, KENTON, near EXETER

FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

CLIFFDEN, TEIGNMOUTH

FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach.

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR,** situated in 20 acres, 1100 ft. up for bracing moorland air.

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P.

Telephones—STARCROSS 259 and TEIGNMOUTH 289

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and Dairy Produce from own farm. Terms very moderate.
CONVALESCENT HOME AT BOURNEMOUTH Detached Villas standing in 12 acres of ornamental grounds, with tennis courts, etc., which Voluntary, Temporary or Certified Patients may visit by arrangement for long or short period.
Illustrated Brochure on application to the Medical Superintendent. The Old Manor, Salisbury. Telephone: Salisbury 3216 and 3217.

TOR-NA-DEE SANATORIUM

Managing Director: DAVID LAWSON, M.D., F.R.S.E.

FOR THE TREATMENT OF PULMONARY TUBERCULOSIS AND ALLIED DISEASES

Medical Superintendent: R. Y. KEERS, M.D.(Edin.)

For prospectus apply to The Secretary, Tor-na-Dee, Murtle, Aberdeenshire Telephone: Cults 107

NORTHUMBERLAND HOUSE

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A PRIVATE HOSPITAL for the treatment of mental and nervous illnesses. Conveniently situated and easy of access from all parts. Six acres of ground facing Finsbury Park. Voluntary and Temporary Patients received without certification. Occupational Therapy, Psychotherapy, and other modern forms of treatment. Air-raid Shelters have been provided.
Telephone: Stamford Hill 2688. *Telegrams:* "SUBSIDIARY, LONDON."
Convalescent Home, KEARSNEY COURT, DOVER.
For further particulars apply to the MEDICAL SUPERINTENDENT.

SHAFTESBURY HOUSE

FORMBY-BY-THE-SEA
Nr. LIVERPOOL

Specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen suffering from NERVOUS and MENTAL breakdown. Voluntary and certified patients received. Ladies also admitted as Temporary Patients without certification. Terms moderate. *Apply*, RESIDENT PHYSICIAN, who may be seen in Liverpool, by appointment. *Tel. No. 8 Formby.*

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NUNEATON
WARWICKSHIRE
('Phone: Nuneaton 241)

Residential treatment of
"Nervous Disorders" & Alcoholism
(Certifiable cases are not received)

This beautiful mansion situated in the heart of the country (less than two hours from London by L.M.S.R.) and surrounded by charming pleasure grounds in which games and outdoor occupational therapy are available is devoted to the treatment of Alcoholism and "Nerves" by psychotherapeutic and ancillary methods

Illustrated Brochure and particulars obtainable from A. E. CARVER, M.D., D.P.M., Resident Medical Superintendent.

CRICHTON ROYAL, DUMFRIES

For NERVOUS AND MENTAL DISORDERS

Separate Villa for patients suffering from the effects of alcoholism and drug addiction. Every facility for complete investigation and individual treatment on the most modern lines. Fully equipped gymnasium, golf course, and indoor swimming pool. Specially trained occupational and recreational therapists. **Special Department for Insulin Therapy.** As the hospital is well endowed terms are exceptionally moderate, e.g., First Department from 3 guineas per week, Second Department, 2 and 2½ guineas per week. Voluntary and certified patients are received. Medical Certificates given anywhere in the British Isles are valid for admission of patients. *For prospectus, necessary forms, and further information apply to:—*
Physician Superintendent, P. K. McCowan, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. *Tel.* Dumfries 1119.

HOLLOWAY SANATORIUM

VIRGINIA WATER

A Registered Hospital for the Treatment of MENTAL DISORDERS of the EDUCATED CLASSES. Founded by THOMAS HOLLOWAY in 1885.

This Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Bedrooms and Special Nurses as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a Branch Establishment at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and be provided with all the comforts of a well-appointed home.

For Terms, apply to—
The RESIDENT MEDICAL SUPERINTENDENT, St. Ann's Heath, Virginia Water, SURREY

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

HAYDOCK LODGE,

NEWTON-LE-WILLOWS, LANCASHIRE.

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES suffering from Mental and Nervous Disorders, Alcoholism and Drug addiction, either voluntarily, temporarily, or under certificate. Patients are classified in separate buildings according to their mental condition. Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *Phone:* Ashton-in-Makerfield 7311. *Tele. Address:* Street, Ashton-in-Makerfield.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental Illness. All forms of treatment available. Fees from 4 gns. per week upwards, according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL. Telephone: Norwich 90.

THE MAGHULL HOMES FOR EPILEPTICS (Inc.)

MAGHULL (near LIVERPOOL)

FARMING and OPEN AIR OCCUPATION for PATIENT

A few vacancies in 1st and 2nd Class Houses.

FEES: 1st Class (men only) from £5 5s. per week upwards. 2nd Class (men and women) 32/- per week.

For further particulars apply: **C. EDGAR GRISEWOOD, A.C.A.** *Secretary*, 20, Exchange Street East, Liverpool, 2

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

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Over 50 years' experience

POSTAL AND ORAL COACHING FOR ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages), sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6313.)

London County Council.

Medical Practitioners required for undermentioned positions in Council's general and special hospitals. Married quarters not available.

TEMPORARY ASSISTANT MEDICAL OFFICERS (Class I), B1—£350–£25–£425. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Duties: (*a*) Surgical, (*b*) General.

TEMPORARY ASSISTANT MEDICAL OFFICERS (Class II), B2—Salary £250. R Practitioners who hold A posts may apply. If held by an R Practitioner the appointment will be limited to six months. Duties: (*a*) General, (*b*) Obstetrics.

All positions are with board, lodging, and washing.

Application forms obtainable (stamped addressed foolscap envelope necessary) from Medical Officer of Health, Staff Division 2, County Hall, S.E.1, returnable by 30th September. Canvassing disqualifies.

London County Council.

RADIO-THERAPEUTIST (temporary) required at HAMMERSMITH HOSPITAL and BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.12. Special qualifications in, or long experience of, Radiotherapy and also good surgical experience essential. Person appointed may be required to undertake courses of instruction for post-graduate students at the Postgraduate School on such terms as may be agreed upon between Council and School.

£1000–£50–£1250 a year (no emoluments).

Particulars and form (stamped addressed foolscap envelope necessary) from Medical Officer of Health (Staff Division 1), returnable by 30th September. Canvassing disqualifies.

London County Council.

ASSISTANT PHYSICIST (temporary) required at HAMMERSMITH HOSPITAL, Ducane-road, W.12, for duties mainly in connexion with X-ray work.

£450–£25–£600 a year (no emoluments).

Particulars and form (stamped addressed foolscap envelope necessary) from Medical Officer of Health (Staff Division 1), returnable by 30th September. Canvassing disqualifies.

Westminster Hospital,

St. John's-gardens, S.W.1.

Applications are invited for the office of "WANDER" SCHOLAR (CLINICAL PATHOLOGIST AND REGISTRAR to the CHILDREN'S DEPARTMENT). Salary £250 per annum. Duties to commence 1st October, 1940. Candidates must be registered Medical Practitioners who have held a resident Hospital post and had some experience in pathology or in diseases of children. The office is a whole-time one, is tenable for one year, and is subject to one month's notice on either side.

Applications (three copies), together with three copies of recent testimonials, should be submitted to the undersigned (from whom further details regarding duties of the office can be obtained) not later than 25th September, 1940.

CHARLES M. POWER, Secretary.

Middlesex County Council.

requires the following:—

(1) RESIDENT HOUSE OFFICER (Male) (A) for STAINES EMERGENCY HOSPITAL, London-road, ASHFORD. Must be registered Medical Practitioners, including R Practitioners within six months of qualification. Salary £120 per annum. Appointment for six months. Applications, stating age, nationality, qualifications with dates, and present post.

(2) RESIDENT ASSISTANT MEDICAL OFFICER (Male), (B1) for COUNTY SANATORIUM AND EMERGENCY HOSPITAL, HAREFIELD. Applications invited from registered Medical Practitioners, including suitably qualified R Practitioners holding B2 or B1 posts who have held house appointments. Experience in the modern treatment of Tuberculosis essential. Salary £400–£25–£475 per annum. Whole-time duties under supervision of Medical Superintendent. Appointment for four years only. Post now vacant.

(3) RESIDENT JUNIOR ASSISTANT MEDICAL OFFICER (B2) for REDHILL COUNTY HOSPITAL, EDGWARE. Must be registered Medical Practitioners, Male or Female, including R Practitioners who hold A posts and have not completed five months' tenure of those posts. Salary £250 per annum. Whole-time duties, mainly medical, under supervision of Medical Superintendent. For six months primarily, may be extended for further six months. Post now vacant.

(2) and (3) Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments.

All applications to the undersigned, subject to medical examination and one month's notice. Emoluments, board, lodging, and laundry. No application forms provided. Relationship to any member or officer of Council to be disclosed. Copies of not more than three recent testimonials to be enclosed. Closing date, 5th October, 1940.

C. W. RADCLIFFE, B3, Clerk of the County Council.

Guildhall, Westminster, S.W.1.

The Royal Waterloo Hospital,
Waterloo-road, S.E.1.

Applications are invited from registered Medical Practitioners (Male and Female) for the appointment of a CASUALTY OFFICER (B2) to become vacant on 7th October, including R Practitioners within six months of qualification. If held by an R Practitioner appointment will be limited to six months. Otherwise it will be subject to renewal. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 25th September.

J. H. TEASDALE, Secretary.

Metropolitan Borough of Woolwich.

APPOINTMENT OF ASSISTANT MEDICAL OFFICER.

Applications are invited from registered Medical Practitioners for the appointment of an Assistant Medical Officer in the Health Department.

The appointment is a whole-time one, and the officer appointed will be required to carry out, under the supervision of the Medical Officer of Health, such duties under the Council's Maternity and Child Welfare Scheme and the Council's Tuberculosis Scheme as may be required from time to time by the Council. Applicants must be qualified in accordance with the provisions of the Local Government (Qualifications of Medical Officers and Health Visitors) Regulations, 1930.

The appointment, which will be during the pleasure of the Council, is subject to the approval of the London County Council, to the By-laws and Regulations of the Borough Council, to termination by one month's notice on either side, and to the provisions of the Local Government Superannuation Act, 1937. The successful candidate will be required to pass a medical examination.

The salary, inclusive of bonus, will be £500 per annum, rising by annual increments of £25 to £700.

Applications, on a form to be obtained from the Medical Officer of Health, Town Hall, Woolwich, S.E.18, and accompanied by copies of not more than three recent testimonials, must be received by me not later than the first post on 5th October, 1940, in an envelope endorsed "Assistant Medical Officer."

Canvassing, either directly or indirectly, any member or officer of the Council will disqualify.

By Order,
DAVID JENKINS, Town Clerk.

Town Hall, Woolwich, S.E.18. September, 1940.

Royal Hospital, Richmond, Surrey.

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from Medical Practitioners (Male) for the appointment of House Surgeon (A) to become vacant on the 24th October, 1940. Salary is at the rate of £100 per annum with full residential emoluments.

Application papers can be obtained from the undersigned and should be returned not later than the 4th October.

M. E. WRIGHT, Acting Secretary-Superintendent.

County Borough of Swansea.

ASSISTANT MEDICAL OFFICER OF HEALTH (Female).

Applications are invited from registered Medical Practitioners under forty years of age for the above post.

Candidates must possess a Diploma in Public Health, or have had at least three years' experience since qualification.

Preference will be given to those having special experience in refraction and the prescription of glasses.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and to the person appointed passing a medical examination.

Salary £500, rising by annual increments of £25 to £700, plus an emergency cost-of-living bonus at the discretion of the Council, which is at present 6 per cent. on the first £300 and 3 per cent. on the next £200.

Application forms may be obtained from the Medical Officer of Health, Public Health Department, Guildhall, Swansea, to whom they should be returned not later than September 27th, 1940.

H. L. LANG-COATH, Town Clerk.

City of Birmingham.

ROMSLEY HILL SANATORIUM. (120 Beds.)

RESIDENT ASSISTANT MEDICAL OFFICER (MALE), A Post.

Applications are invited from registered Medical Practitioners, including R Practitioners within three months of qualification, for a Resident Assistant Medical Officer (Male), A post. Candidates must be unmarried and have held resident hospital appointment since qualifying. Experience in the diagnosis and treatment of tuberculosis will be a recommendation.

The appointment will be limited in the first instance to six months, and, subject to satisfactory service, may be extended for a further six months. If held by an R Practitioner the appointment will be for a period of six months. The salary will be at the rate of £240 per annum for the first six months and £275 per annum for the second six months, with board and residence in each case.

Forms of application may be obtained from the Medical Superintendent, Romsley Hill Sanatorium, Halesowen, near Birmingham, and should be returned to him not later than Thursday, 26th September, 1940.

F. H. C. WILTSHIRE, Town Clerk.

City of Birmingham.

ERDINGTON HOUSE EMERGENCY HOSPITAL.

JUNIOR ASSISTANT MEDICAL OFFICER (A Post).

Applications are invited from registered Medical Practitioners (Male or Female), including R Practitioners within three months of qualification, for a Junior Assistant Medical Officer (A post), at the Erdington House Emergency Hospital. Candidates must be capable of administering anæsthetics.

The appointment will be for a period of six months and the salary will be at the rate of £300–£350 per annum, according to experience, plus board-residence.

Applications, together with copies of three recent testimonials, should be sent to the Medical Officer of Health, Council House, Birmingham, 3, on or before Thursday, 26th September, 1940.

City of Birmingham.

PUBLIC HEALTH AND MATERNITY AND CHILD WELFARE DEPARTMENT.

LITTLE BROMWICH HOSPITAL FOR INFECTIOUS DISEASES.

JUNIOR RESIDENT MEDICAL OFFICER (A Post).

Applications are invited from registered Medical Practitioners including R Practitioners within three months of qualification, for a Junior Resident Medical Officer, Male or Female (A post). Candidates must be unmarried and must have held previous resident posts in general or children's hospitals.

Salary will be at the rate of £300 per annum, together with board, &c., valued at £150 per annum. If held by an R Practitioner the appointment will be for a period of six months, otherwise it will be limited to twelve months.

It is not feasible to attend classes for the D.P.H. in conjunction with this appointment.

Forms of application may be obtained from the Medical Superintendent, Little Bromwich Hospital, Birmingham, 9, and should be returned to the Medical Officer of Health, Council House, Congreve-street, Birmingham, 3, not later than Thursday, 26th September, 1940.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF CASUALTY OFFICER AND SUPERNUMERARY HOUSE OFFICER (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of Casualty Officer and Supernumerary House Officer (A) to become vacant on October 9th, 1940, including R Practitioners within three months of qualification. The appointment will be for a period of six months, but is terminable at an earlier date by one month's written notice on either side. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Thursday, October 3rd, 1940.

J. A. BEARDSALL, Secretary-Superintendent.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of House Physician (A) to become vacant on November 1st, 1940, including R Practitioners within three months of qualification. The appointment will be for a period of six months, but is terminable at an earlier date by one month's written notice on either side. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Thursday, October 3rd, 1940.

J. A. BEARDSALL, Secretary-Superintendent.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF RESIDENT ANÆSTHETIST AND EMERGENCY OFFICER (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of Resident Anæsthetist and Emergency Officer (A) to become vacant on October 9th, 1940, including R Practitioners within three months of qualification. The appointment will be for a period of three months. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Thursday, October 3rd, 1940.

J. A. BEARDSALL, Secretary-Superintendent.

The Royal Hospital, Sheffield.
(422 Beds.)

Applications are invited from registered Medical Practitioners, Male and Female, for the post of HOUSE SURGEON to the E.N.T. DEPARTMENT (A), including R Practitioners within three months of qualification. If held by an R Practitioner appointment will be for a period of six months. Salary is at the rate of £80 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the Superintendent at once.

Birmingham United Hospital.

(THE GENERAL HOSPITAL, THE QUEEN'S HOSPITAL, THE QUEEN ELIZABETH HOSPITAL.)

THE QUEEN ELIZABETH HOSPITAL.

APPOINTMENT OF TWO RESIDENT SURGICAL REGISTRARS (B1).

There will be, on October 1st, vacancies at the Queen Elizabeth Hospital for two Resident Surgical Registrars. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding the diploma of F.R.C.S. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than September 27th.

G. HURFORD, Secretary.

Birmingham and Midland Eye Hospital,

Church-street, BIRMINGHAM, 3.

Applications are invited for the post of SURGICAL REGISTRAR (B1) to the Hospital.

Candidates must have had not less than two years' experience in Ophthalmic work, and should have held a resident post in an Ophthalmic Hospital for at least one year. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply.

Appointment will be for one year, with eligibility for reappointment.

Salary at the rate of £250 per annum, which includes payment for attendances at the Branch Hospital. Particulars of duties, &c., may be obtained on application.

Applications, together with copies of testimonials, to be sent immediately, addressed to the undersigned.

F. M. HAUGHTON, House Governor.

The Royal Infirmary, Sunderland.

Applications are invited from Male registered Medical Practitioners for the appointment of HOUSE SURGEON (A) to become vacant on the 1st October, 1940.

The appointment will be limited to six months.

The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned at the earliest possible date.

M. J. HUNTLEY, House Governor and Secretary.

Elizabeth Garrett Anderson Hospital AND OSTER HOUSE, ST. ALBANS.

Applications are invited from fully qualified Medical Women for the following posts: One HOUSE SURGEON for E.G.A. Hospital and two HOUSE SURGEONS for Oster House, for a period of six months, duties to commence 1st November.

Salaries will be pooled under the Emergency Medical Services Scheme and allocated according to experience, with a minimum of £100 per annum.

Applications, with copies of three testimonials, should be sent to the Secretary, E.G.A. Hospital, Euston-road, N.W.1, by 30th September.

The Children's Hospital, Sheffield.

(157 Beds.)

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of a HOUSE PHYSICIAN (A) to become vacant on 24th October, 1940, including R Practitioners within three months of qualification. Appointment is for a period of six months. Salary at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

T. H. G. GARTLAND, Superintendent and Secretary.

Bedford County Hospital.

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of a 2nd HOUSE SURGEON (A) to become vacant on October 1st, including R Practitioners within six months of qualification. Appointment for a period of six months. Salary £150 per annum, with full residential emoluments. Application, stating age, qualifications, with dates and nationality, together with three recent testimonials, to be sent to the Secretary, Hon. Medical Staff Committee, as soon as possible.

Doncaster Royal Infirmary.

Applications are invited from registered Medical Practitioners (Male) for the appointment of ORTHOPÆDIC HOUSE SURGEON (P2), including R Practitioners who now hold A posts. If held by an R Practitioner the appointment will be limited to six months.

The salary is at the rate of £175 per annum, with usual emoluments.

Applications, together with copies of two recent testimonials, should be forwarded to the undersigned immediately.

R. LANCASTER, Secretary-Superintendent.

Royal Sussex County Hospital, BRIGHTON.

(380 Beds.)

APPOINTMENT OF A CASUALTY HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners (Male) for the appointment of a Casualty House Surgeon (A) to become vacant on 5th October, 1940, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Otherwise it will be for a period of at least six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to the undersigned.

L. L. W. LANCASTER-GAYE, Secretary-Superintendent.

Tilbury Hospital, Tilbury, Essex.

The Committee of Management of the Seamen's Hospital Society invite applications from registered Male Medical Practitioners for the appointment of SENIOR RESIDENT HOUSE OFFICER (B2) becoming vacant on the 1st October, including R Practitioners who now hold A posts. If held by an R Practitioner the appointment will be limited to six months. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of recent testimonials, should be sent immediately to the undersigned.

F. A. LYON, Secretary.

Seamen's Hospital Society, Greenwich, S.E.10.

Grimsby and District Hospital.

RESIDENT ANÆSTHETIST AND JUNIOR HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners for the above appointment, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Salary is £175 per annum.

Applications, stating age, qualifications, with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

H. B. COATES, Secretary-Superintendent.

11th September, 1940.

City of Portsmouth.

SAINT MARY'S HOSPITAL. (1275 Beds.)

Applications are invited for the immediate appointment of Two JUNIOR ASSISTANT RESIDENT MEDICAL OFFICERS (A posts). Applicants may include R Practitioners within six months of qualification. If held by an R Practitioner, appointment will be limited to six months, with possible extension to twelve months. Salary at the rate of £200 per annum, with residential emoluments valued at £125 per annum.

The above appointment is subject to the provisions of the Local Government Superannuation Act, 1937.

Application forms may be obtained from, and must be returned to, the Acting Medical Officer of Health, Northern Secondary School, Portsmouth, forthwith.

Canvassing will be a disqualification.

F. J. SPARKS, Town Clerk.

The Guildhall, Portsmouth, 11th September, 1940.

City of Sheffield.

ASSISTANT MEDICAL OFFICER FOR MATERNITY AND CHILD WELFARE (WOMAN).

Applications are invited from duly qualified Medical Women under forty years of age and of not less than three years' standing in the profession for the above post.

Candidates must have held a resident hospital post and have had recent special clinical experience in antenatal work, midwifery, and children's diseases.

Salary £500 per annum, rising by annual increments of £25 to £700 per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applications, stating age, qualifications, and experience, with copies of three testimonials, to be sent on or before September 30th, 1940, to the Medical Officer of Health, Town Hall, Sheffield.

Fife County Council.

CAMERON BRIDGE HOSPITAL.

Applications are invited from registered Medical Practitioners for the appointment of RESIDENT SURGICAL OFFICER at Cameron Bridge Hospital. Applicants should have held house appointments and have had surgical experience. Preference will be given to candidates holding a higher qualification in surgery. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £550 per annum, with board, lodging, and laundry in the case of a single man and unfurnished house in the case of a married man.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the County Medical Officer, County Buildings, Cupar, not later than 21st September, 1940.

J. M. MITCHELL, County Clerk.

County Buildings, Cupar, 10th September, 1940.

County Borough of Burnley.

ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from registered Medical Practitioners of either sex for the above position.

The duties will be mainly in connexion with the School Medical Service, but frequently include Maternity and Infectious Diseases.

Salary £500, rising by £25 per annum to a maximum of £700 per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Conditions of appointment and forms of application may be obtained from the Medical Officer of Health, 27, St. James'-street, Burnley, to whom applications should be returned not later than 5th October, 1940.

ARCHIBALD GLEN, Town Clerk.

Town Hall, Burnley, 12th September, 1940.

Manchester Victoria Memorial Jewish

HOSPITAL (Non-Sectarian), Elizabeth-street, CHEETHAM. (103 Beds.)

Applications are invited from registered Medical Practitioners, Male, for the appointment of a CASUALTY HOUSE SURGEON (A), including R Practitioners within six months of qualification. Appointment will be limited to six months. Salary is at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than September 30th, 1940.

D. ROBERTS, Superintendent and Secretary.

Manchester Ear Hospital,

Grosvenor-square, ALL SAINTS'. (30 Beds.)

Applications are invited from registered Medical Practitioners, Male and Female, including R Practitioners within three months of qualification, for the appointments of RESIDENT and NON-RESIDENT HOUSE SURGEONS (A) at once. Salaries at the rate of—Resident House Surgeon £120 per annum, with full residential emoluments; Non-resident House Surgeon £150 per annum, with partial board. In the case of R Practitioners, appointment will be for a period of six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to Mr. REGINALD S. MILFORD, Hon. Secretary, Manchester Ear Hospital, c/o Mr. W. J. Ellam, 17, Brazennose-street, Manchester, 2.

Herefordshire County Council.

THE COUNTY HOSPITAL—HUTMENTS ANNEXE.

Applications are invited from registered Medical Practitioners for the following temporary resident appointments under the Emergency Medical Organisation:—

(1) SENIOR MEDICAL OFFICER (B1), at £350 per annum. A higher medical or surgical qualification desirable. (Suitably qualified R Practitioners holding B1 or B2 appointment may apply.)

(2) HOUSE OFFICER (B2), at £200 per annum. Hospital experience desirable. (R Practitioners who now hold A posts may apply. If held by an R Practitioner the appointment will be limited to six months.)

Applications should be sent to the Clerk of the Council, Shirehall, Hereford, not later than Tuesday, 24th September, 1940.

Coventry and Warwickshire Hospital.

(452 Beds.)

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B1)

Applications are invited from registered Medical Practitioners for the appointment of Resident Surgical Officer. Applicants must have held house appointments and have had previous surgical experience. Preference will be given to candidates holding the Diploma of F.R.C.S., and suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £350 per annum, with full residential emoluments. The appointment is for twelve months in the first instance, and is renewable.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be addressed to the undersigned immediately.

S. CECIL HILL, House Governor and Secretary.

Coventry and Warwickshire Hospital.

(452 Beds.)

FRACTURE AND ORTHOPÆDIC SERVICES.

Applications are invited for the post of RESIDENT REGISTRAR to the FRACTURE AND ORTHOPÆDIC DEPARTMENT (B1). Salary at the rate of £350 per annum, with full residential emoluments.

Candidates should hold the M.S. Degree of a university of the United Kingdom, or hold the Diploma of F.R.C.S., and must have had experience in modern methods of the treatment of fracture cases. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. The appointment is for twelve months in the first instance, and is renewable.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

S. CECIL HILL, House Governor and Secretary.

Dewsbury and District General

INFIRMARY, DEWSBURY. (100 Beds.)

Applications are invited for the post of SECOND HOUSE SURGEON (A) (Male) now vacant, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Salary £150 per annum, with emoluments. The duties are principally those of a House Physician and Casualty Officer.

The Infirmary is a modern Voluntary Hospital and has the usual Special Departments, with Visiting Consulting Specialists in attendance.

Applications, stating age, qualifications with dates, and nationality, together with copies of recent testimonials, to be addressed to the undersigned without delay.

FRED SMITH, Secretary-Superintendent.

County Borough of Swansea.

PUBLIC HEALTH DEPARTMENT.

HILL HOUSE ISOLATION HOSPITAL.

RESIDENT MEDICAL OFFICER (MALE OR FEMALE).

Applications are invited from registered Medical Practitioners of either sex for the post of Resident Medical Officer (A). Previous experience not essential. The appointment is limited to one year, will not be renewable, and will be terminable at any time within the year by one month's notice on either side.

Salary £200 per annum, with board, residence and laundry.

Applications, stating age and qualifications, with copies of not less than three recent testimonials, should be sent to the Medical Officer of Health, The Guildhall, Swansea, not later than 27th September, 1940.

Rotherham and District General

HOSPITAL.

(140 Ordinary and 70 War Emergency Beds.)

CASUALTY OFFICER (A).

Applications are invited from registered Medical Practitioners (Male) for the above appointment to become vacant on the 1st October, including R Practitioners within three months of qualification. If held by an R Practitioner the appointment will be for a period of six months. Salary £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned forthwith.

T. H. FLETCHER, Secretary-Superintendent.

Rotherham Hospital, Doncaster Gate, Rotherham, Yorks.

Kent and Sussex Hospital.

ROYAL TUNBRIDGE WELLS.

EAR, NOSE, AND THROAT SURGEON AND RESIDENT ANÆSTHETIST.

Applications are invited from registered Medical Practitioners (Male) for the appointment of Surgeon to the Ear, Nose, and Throat Department and also to act as Resident Anæsthetist (B2) to become vacant about the middle of October, including R Practitioners who now hold A posts. If held by an R Practitioner the appointment will be limited to six months. The minimum salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 28th September.

TOM B. HARRISON, Superintendent-Secretary.

16th September, 1940.

BOVRIL MEDICAL AGENCY, LTD.

ALDINE HOUSE, 10-13, BEDFORD STREET, STRAND, LONDON, W.C.2

Telegrams: BOVMEDICAL, LESQUARE, LONDON. Managing Director: F. M. THEW. *Telephone:* TEMPLE BAR 1616 (3 lines)

SCOTTISH BRANCH: 13 MELVILLE STREET, EDINBURGH, 3.

The maximum commission payable on the sale of any Practice or Partnership in Great Britain, placed exclusively in the hands of this Agency, is £50 (Fifty Pounds), which sum covers goodwill, drugs, surgery fittings, fixtures and furniture, instruments and book debts, but not house property. Schedule of Terms will be forwarded on application. Locum Tenens and Assistants supplied to Principals at short notice, without charge. Full particulars of Practices and Partnerships for sale will be sent immediately to interested applicants on receipt of a note of their requirements.

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County Council of Durham.

ASSISTANT WELFARE MEDICAL OFFICER.

The County Health Committee invite applications for an Assistant Welfare Medical Officer (Woman) at a commencing salary of £600 per annum, rising by annual increments of £25 to £700 per annum. Travelling allowance will be paid by the County Council in accordance with a scale to be approved from time to time.

The appointment will be subject to the regulations for the time being of the County Council relative to the payment of salary in the case of sickness, and will be terminable by three months' notice on either side. The appointment will be also subject to the following conditions:—

(1) The officer appointed must be a registered Medical Practitioner between the ages of twenty-five and fifty-five years; must devote the whole of her time to the duties of the office; and must not engage in private practice.
(2) She should either have had a previous appointment as Medical Officer of an ante-natal clinic, with the approval of the Minister of Health, or have had at least three years' experience in the practice of her profession and special experience of practical midwifery and antenatal work. The holding of a Diploma in Public Health will be deemed an additional qualification for the post.
(3) She will be subject to the directions of the County Medical Officer of Health.
(4) She will be required to reside in Durham City, or such other place as required by the Council.
(5) She must be prepared to undertake any duties in connexion with the Maternity and Child Welfare Services of the County Council, including attendance at Birth Control Clinics.
(6) She must be prepared, if called upon, to act as locum tenens to other members of the medical staff of the County Medical Officer of Health.
(7) The appointment will terminate on marriage.
(8) The candidate will be required to pass the County Council's medical examination, and will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applications, endorsed "Assistant Welfare Medical Officer," with copies of not more than three recent testimonials, must be addressed to the County Medical Officer of Health, Shire Hall, Durham, and must be received by him not later than Saturday, 28th September, 1940.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham, 9th September, 1940.

City of Portsmouth.

RESIDENT MEDICAL OFFICER AT THE INFECTIOUS DISEASES HOSPITAL (291 Beds) AND ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from unmarried Medical Practitioners (Male) who have had experience of infectious diseases and possess the Diploma in Public Health for the above appointment. Salary £500–£700, rising by annual increments of £25, inclusive of residential emoluments which are valued at £125.

The gentleman appointed will be required to devote his whole time to the office, which will also include duties in connexion with the work of the Public Health Department as assigned to him by the Medical Officer of Health.

The position is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful applicant will be required to pass a medical examination.

Application forms may be obtained from, and must be returned to, the Acting Medical Officer of Health, Northern Secondary School, Portsmouth, not later than Monday, 30th September, 1940.

Canvassing will be a disqualification.

F. J. SPARKS, Town Clerk.

The Guildhall, Portsmouth, 7th September, 1940.

The Chester Royal Infirmary.

(Normal Capacity 225 Beds.)

Applications are invited from registered Medical Practitioners for the appointment of RESIDENT ORTHOPÆDIC OFFICER (B1) to become vacant on the 1st October, 1940.

Applicants should have held house appointments, and had Orthopædic experience.

Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. The salary is at the rate of £250 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by three recent testimonials, should be sent to the undersigned not later than the 3rd October.

W. H. GRACE, Hon. Secretary, Medical Committee.

County Borough of Croydon.

WARLINGHAM PARK HOSPITAL (For Nervous and Mental Disorders), WARLINGHAM, SURREY.

HOUSE PHYSICIAN (Lady or Gentleman) required.

Applications are invited from registered Medical Practitioners (Lady or Gentleman), including R Practitioners within three months of qualification, for the post of House Physician (A). Six months' appointment. Excellent opportunities for experience in all modern methods of treatment, including insulin, cardiazal and electric shock therapies, and in out-patient clinics, including child guidance, and the scientific treatment of delinquency. Salary at the rate of £200 per annum, with board, residence, and laundry.

Applications, stating age, qualifications, and experience, to the Medical Superintendent.

County Borough of South Shields.

MATERNITY HOSPITAL.

Applications are invited from fully qualified and registered Women Medical Practitioners for the appointment of an ASSISTANT MEDICAL OFFICER for duty at the New Maternity Hospital.

Salary £350 per annum, rising by annual increments of £25 to £450 per annum, together with emoluments valued at £100 per annum. The salary and emoluments are subject to a deduction for superannuation purposes.

The appointment is subject to the Local Government Superannuation Act, 1937, and to the Council's Staff Regulations.

The successful candidate will be required to pass a medical examination.

Applications, on forms to be obtained from the Medical Officer of Health, Public Health Department, Stanhope-road, South Shields, stating experience and qualifications, and accompanied by copies of two recent testimonials, to be sent to the Town Clerk, Town Hall, South Shields, not later than 1st October, 1940.

Canvassing in any form will disqualify the candidate for the appointment.

HAROLD AYREY, Town Clerk.

Town Hall, South Shields, 14th September, 1940.

Wrexham and East Denbighshire

WAR MEMORIAL HOSPITAL.
(170 Beds.)

Applications are invited from registered Medical Practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON (A) for EAR, NOSE AND THROAT, OPHTHALMIC and MEDICAL DEPARTMENTS, to become vacant on October 1st, 1940, including R Practitioners within three months of qualification. The appointment is for a period of six months. Salary £150 per annum, with full residential emoluments.

Applications, stating age, nationality, experience, and qualifications, with copies of three recent testimonials, to be sent to the undersigned immediately. LESLIE SPENCER, Secretary.

Royal Hampshire County Hospital,

WINCHESTER.

Applications are invited from registered Medical Practitioners for the appointment of RESIDENT SURGICAL REGISTRAR (B1) to become vacant immediately. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding Diploma of F.R.C.S. with experience of ear, nose, and throat. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £250 a year.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three testimonials, should be sent to the undersigned.

H. EWART MITCHELL, Superintendent and Secretary.

A Private Mental Hospital, near

London, requires a DEPUTY MEDICAL SUPERINTENDENT and a JUNIOR ASSISTANT MEDICAL OFFICER (both unmarried).

Deputy Medical Superintendent: Salary £500 per annum, with full residential emoluments.

Junior Assistant Medical Officer: Salary £300 per annum, with full residential emoluments. Facilities, including study leave during the second year, for the D.P.M. may be granted.

Applications, giving full particulars and enclosing copies of two recent testimonials, should be addressed to the Medical Superintendent, Address No. 733, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2, to reach him not later than Saturday, September 28th.

Full-time Medical Officer required for

group of foundries in neighbourhood of Birmingham and Coventry.

Salary £600–£700 per annum, according to experience and qualifications. Applications to: Address, No. 734, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

Appointment of Works Medical Officer

to large group of Engineering Factories in the MIDLANDS.

Applications are invited for the services of a whole-time Medical Officer. Preference will be given to applicants who have had experience in a large general hospital in an industrial district, who hold the D.P.H., and are between thirty-five and fifty years of age. A minimum salary of £650 per annum will be paid.—Address, No. 732, THE LANCET Office, 7, Adam-street, Adelphi, W.C.2.

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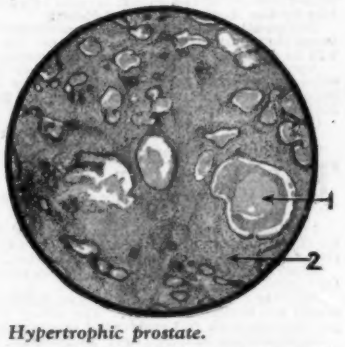

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